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## SANITARY MATTERS:

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1872.





# GLEANINGS.

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FROM THE REPORT OF THE BOARD OF HEALTH OF  
THE CITY OF NEW YORK, FOR 1871.

Remarks of J. S. BASWOR, the President.

*Drainage of Vacant Lots.*—This important subject has received due consideration, and under the orders of the Board many vacant lots have been relieved of stagnant water.

Obstructions of sewers and culverts, and defects in street pavements, resulting in accumulations of stagnant water and filth, have been remedied.

The cleaning of the streets is unquestionably of the greatest importance to the public health, and must always receive the attention of the proper authorities. That the cleaning of certain other streets, especially those which are densely populated by the indigent classes, and during the summer months more frequently than is required by the contract above referred to, is absolutely a sanitary necessity, has been for some years generally acknowledged.

The streets of New York, during the summer and autumn of the year 1870, presented an appearance of cleanliness unparalleled in the recent history of this city, and unequalled by few, if any, of the large towns in the old or new world. And it is confidently believed that

the remarkable health of the city during the extreme heat of the summer of 1870, and the absence of contagious and infectious diseases during that period, was due, to a very considerable extent, to the uniform cleanliness of the streets.

The danger to the public health, present and prospective, to be apprehended from the use of garbage in filling sunken lots and streets will thus be entirely avoided.

The Board of Docks have also repaired many of the old and decaying piers, which were believed to be sources of disease to the surrounding districts.

The old and dilapidated wooden structures which now surround the business portions of New York, form a vast network within which the sewage of the city, composed of house and privy filth, the refuse of slaughter houses, workshops, and manufactories accumulates, and together with the waste of commerce and the constant influx of sediment from adjacent shores, forms a stratum of putrescible organic matter of great depth and extent. By the movements of the tides and of the vessels, this vast bed of filth is constantly agitated, its elements intermixed, and the process of decomposition thereby hastened. The result is apparent to those who frequent the docks in summer season, in the escape of immense quantities of the most offensive and deleterious gases. Not unfrequently laborers along the shore are compelled to leave their work, so offensive and sickening are these odors. The effect of these malarious emanations upon those whose business confines them much to the docks and the vessels at the wharves is most disastrous, in the summer and autumn, severe and fatal forms of fever and diarrhœal diseases are prevalent. The history of many epidemics in New York shows that they either originated



about the docks, or manifested the greatest virulence among those whose dwellings are in their vicinity.

The effect upon the public health, also of the constant diffusion of such volumes of noxious gases from a large portion of the water front is most injurious. Many outbreaks of fever, dysentery, and similar diseases, in the more central districts, have been regarded as excited or greatly aggravated by this source of contamination of the air.

The only remedy against these sanitary evils, is a system of docks such as are now projected, made of imperishable material, with a water front presenting a smooth surface to be thoroughly flushed by the tides, and from which all accumulations from sewers and other sources are constantly removed.

During this survey all nuisances discovered were reported in regular form, and were subjects for orders of the Board; and all violations of the "Tenement House Act," and cases of non-compliance with said act, were, after due notice, prosecuted by the Attorney in the name of the Board, for the penalty imposed by law. These decisive measures have resulted in the improved ventilation, sewerage, and general cleanliness of tenement houses, and have materially aided in preserving the health and promoting the comfort of an important portion of the city population during the remarkable heat of the last summer.

Although less than one-half the total population of New York occupy tenement houses, yet nearly 76 per cent. of the total mortality occurred among this class in 1868; in 1869 it fell to 68 per cent. and in 1870 it was reduced to about 66 per cent. a gain of  $9\frac{1}{2}$  per cent. in three years. This gives a saving of 2,600 lives.

This remarkable reduction in the death rate of the inhabitants of tenement houses has followed directly upon a most thorough inspection and reconstruction of these dwellings of the poorer classes. To preserve the lives and health of those who are obliged by circumstances to occupy the densely crowded sections of the city, must continue to be one of the most important duties of this Board.

The permits granted by the Board of Health to occupy cellars and basements for human habitations having been revoked, new permits have been from time to time granted or denied by the Board. In some cases cellars heretofore occupied have been ordered vacated, and in a large number, permits have been withheld until improvements had been made in the ventilation and drainage of the premises. The Board fully appreciates its duty in this particular, and does not hesitate to cause cellars to be vacated wherever, by reason of contagious disease, such a course seems to be necessary.

*Houses Dangerous or Unfit for Human Habitation.*—At various times during the year the Board has ordered houses to be vacated, because said houses were, by reason of want of repair, unfit for human habitation. In consequence of the large accumulation of offal, and dead animals in all stages of decomposition, and the delay in the removal of the same, this dock became a most offensive nuisance.

To abate the nuisance caused by the transportation of swill and other refuse matter from the city, such as hotel or house swill, or garbage, or offensive material of a liquid nature, or partly liquid, shall not be transported along or through any street of the City of New York except in tightly covered iron bound casks or boxes, and

that none of the contents of such casks or boxes shall be allowed to fall or leak or spill therefrom.

The bringing of fat, lard, or tallow—except as a part of the living animal,—into the City of New York, to be melted or rendered, and the melting or rendering of the same, are prohibited. The Board refused to grant permits to melt fat or tallow at any place within the built-up portions of the city,

*Other Offensive Trades.*—In addition to the various kinds of business connected with the slaughtering of animals, which, if carelessly or improperly conducted, are liable to be complained of, the attention of the Board has been called to other manufacturing pursuits located in the crowded parts of the city, as being detrimental to the public health. Among these may be mentioned all factories emitting large quantities of smoke, which enters the neighboring tenements and is injurious to the weak and invalid, if not to those in health, and which deprives the inmates of fresh air, and compels them to keep their doors and windows constantly closed.

As it is a fact well established in older cities that this nuisance can be abated at small expense, the Board has adopted an ordinance, that from and after the 1st of June, 1870, every furnace employed in the working of engines by steam, or in any mill, factory, printing house, dye factory, iron foundry, glass-house, distillery, brew-house, sugar refinery, bake-house, gas works, or in any other buildings used for the purposes of trade or manufacture, shall be so constructed as to consume or burn the smoke arising therefrom, unless a permit to the contrary be obtained from this department. Under this ordinance many nuisances of this character have been abated. Complaints have also been entered by the

Health Inspectors against the plaster and lime mills of the city, it being claimed that the dust from said mills enters all dwellings in their vicinity, and is detrimental to the health and comfort of the people.

*Cows, Swine, and Goats.*—The keeping of cows, swine, and goats in the built-up portions of the city has been almost entirely discontinued.

*Bureau of Sanitary Inspection.*—The work of this Bureau comprises the inspection of nuisances, the care of contagious diseases, the regulation of tenement houses, cleansing and disinfection.

*Bureau of Street-Cleaning.*—The duty of the Bureau of Street-cleaning is to inspect the public streets and report upon their sanitary condition so far as regards cleanliness. The chief officer of this bureau is also required to report any neglect or omission on the part of the contractor for street-cleaning in the performance of his duties.

The importance of this thorough cleaning of the streets, as a sanitary measure, can scarcely be overestimated. Filthy streets during the summer are a most fruitful source of diarrhœal diseases in all parts of the city, but in the tenement house districts they are a known cause of the high death rate from these affections. The past season was peculiarly adapted, by the long continued dry weather, to intensify the poisons which street filth generate, but the constant cleansing and disinfection of the more densely populated streets rendered, there is reason to believe, the sickness and mortality rates from diseases due to local uncleanness much less than they otherwise would have been.

During the year ending April 10, 1871, the number of orders issued by this Board for the abatement of

nuisances was eleven thousand six hundred and eighty. Among these were the following: Alleys cleaned 95. Areas cleaned 139. Ashes, filth, garbage, etc. removed (No of orders) 1,813. Basements cleaned 24. Ceilings cleaned and whitewashed 115. Cellars cleaned 723. Cellars disinfected 202. Cellars vacated 100. Cesspools cleaned 29. Cesspools repaired 109. Drains, (with obstructions in) removed 102. Leather tanning (business of) discontinued 7. Manure removed (orders) 527. Pipes, soil ( obstructions in) removed 128. Privies disinfected, emptied, and cleaned 2,728. Privy vaults repaired 332. Sewers repaired 124. Sewers (obstructions in) removed and repaired 2,829. Slaughtering (business of) discontinued 6. Stables cleaned 71. Stagnant water removed (No. of orders) 58. Water-closets cleaned 73. Yards cleaned 1,116. Yards graded and repaired 237.

#### REPORT OF THE SANITARY SUPERINTENDENT.

The time has arrived when these diseases, bearing certain elements of an infectious character, should be better controlled by sanitarians. Isolation, disinfection, and cleanliness, are the chief means by which these diseases may be thus controlled.

When great numbers become affected the elimination of the poisonous element, which is certainly something portable, assumes such magnitude or quantity, and its diffusibility is so great that, like the "yeast which leavens the whole lump," all who are susceptible become contaminated therewith.

If proper sanitary measures were well understood by the medical profession and the people generally, and efficiently applied, the epidemic form at least might be prevented.

## TYPHOID FEVER.

Total number of cases of Typhoid fever during year ending March 31, 1871, 615.

Total number of houses in which cases of Typhoid fever occurred, 476.

## TENEMENT HOUSES.

*Ventilation.*—The past efforts of the Health Department, in securing a proper supply of air and light in tenement houses, have at length resulted in a general compliance with the 2d Section of the Tenement House Act, which is very apparent to the Inspectors, and which has insured a permanent benefit to this class of people.

In view of the inclination of many tenants to keep the ventilating windows of their rooms closed on the plea of “too much air,” or “too little privacy,” it has been suggested by Inspector Frankel that, “instead of glazed sashes, wired frames be used, with meshes sufficiently small to prevent strong gusts of air from the halls.

Defects of ventilation and insufficiency of light are not however, confined to tenement houses.

Many private houses, and a large proportion of the business buildings which crowd our lower wards, are so poorly provided in these respects as seriously to impair the health of those who are compelled to pass a large portion of their waking hours in them; and there is much of justice in the remarks contained in the report of Inspector Stiles in regard to “architectural causes of disease,” and in the suggestion of Inspector Viele, that all plans for public buildings at least, should be submitted to the Board of Health for examination prior to their erection, with the view of securing in the original construction a proper amount of ventilation.



*Popular Sanitary Education.*—It is, indeed, evident to those who from long experience are best able to judge, that the labors of the health inspectors during the past six years are beginning to bear their legitimate fruit in the gradual education of the people to an appreciation of the importance of ventilation, cleanliness, and light.

“Thoughtless minds cannot but receive new and lasting impressions on these subjects when they see the hand of authority vacating unwholesome cellars, sweeping away rubbish and filth, and throwing open new windows to the air and sunlight.”

In regard to the construction of tenements, there is need of constant vigilance on the part of the Board and its officers to prevent the erection of buildings which technically comply with the letter of the law, but are really evasions of its spirit.

#### CELLAR AND BASEMENT HABITATIONS.

Under orders of the Board, many cellars and basements have been vacated as human habitations, and are now occupied for storage or other purposes, the remainder having been so remodelled as to be tolerated as temporary dwellings. In spite of all that can be done, however, to render underground apartments fit for this purpose, it still remains apparent that their occupation can only be defended on the barest grounds of *necessity*. No amount of repair or alteration can make them fit for human dwellings, for, even when cemented and provided with the light and space prescribed by law, the natural moisture inseparable from the soil, together with the proximity of privy vaults, water closets, sewer and water pipes, and out-buildings, give rise to noxious gases and dampness which cannot fail to depreciate health.

Total prohibition by law of all cellar and basement habitations, if enforced, would be an immense benefit to the poor, for they would thus be driven to other localities, where the highest rooms in tenement houses can be obtained for about the same prices as are now paid for these dismal "holes in the ground."

#### PRIVIES AND WATER CLOSETS.

These prolific sources of annoyance and complaint still continue to form a considerable portion of the work imposed upon sanitary inspectors, the larger portion, of course, occurring in tenement houses and buildings occupied for business purposes by a large number of persons.

The *privy vault without sewer connection* is, all things considered, the simplest and most easily managed for tenement house use; but a return to its use now would perhaps be inadmissible on account of the frequent necessity of emptying, carting of the contents through the streets, etc., etc., entailing evils and inconveniences which, under the best regulations, cannot fail to excite disgust and complaint.

The present sewerage of the whole east side of the city, from Fourteenth street to the Battery, is, in a great measure, defective and inadequate to the necessities of the dense population which covers or occupies that section. The matter of sewerage, including the complicated questions arising from "tidal reflux," offers a problem to the engineers of the Department of Public Works, the successful solution of which would effect a remarkable change in the character and sanitary condition of the whole east side of the town.

The evil results of defective sewerage in the older portions of the city have been strongly marked in the sani-

tary record of the city in days past, and are again strongly expressed in the accompanying reports of the Inspectors.

Inspector O'Leary, of the opposite district, says "Defective sewerage is the root of all the unsanitary influences which curse the upper end of the island," and will entail upon the future city a far weightier burden of sanitary trouble than can readily be compensated for by broad avenues, splendid boulevards, or lovely parks.

Medical and sanitary science and experience forbid erecting dwellings upon an undrained soil. Heat and capillary attraction bring to the surface that moisture and dampness which should have been removed by sanitary engineering. The result is malarial fevers, and tuberculosis, suffering and death, as punishments for neglected applications afforded by the light of science.

#### GARBAGE AND ASHES.

The much vexed and never settled question of how best to get rid of this class of nuisances still worries the patience and defies the experience of the Inspectors.

#### CLEANING OF STREETS.

During the past year a marked improvement in the condition of those streets heretofore habitually in a filthy condition has taken place. Under the requisitions of the Board for extra cleaning, the streets were cleaned daily during several months of the warm season, with the result of a decided increase in the salubrity and of removing one of the prime causes of the persistence of relapsing fever in those densely populated districts. The direct benefit thus secured to life and health far more than counter-balanced the cost.

Keeping the streets clean is a fundamental sanitary method of promoting the public health and reducing the death rate. Sections of the city, densely populated as they are in tenement house districts, reek with the filth thrown upon the streets from day to day; garbage and house slops form decomposing masses of filth, which, under the influence of solar heat during the hot months, generate such poisonous gases as directly induce those diarrhoeal diseases which swell the mortuary records of those months.

#### YARDS, AREAS, AND ALLEYS.

As before stated—Tenement Houses—there is a manifest improvement in regard to keeping of these places; but a serious impediment to their being properly kept is to be found in defective grading and paving.

#### STABLES.

The special survey of stables ordered by the Board, in the early part of the present year, resulted in a valuable amount of information, which is embodied in the accompanying report (marked K.)

The inspectors agree in saying that these “necessary evils” in our midst require the constant and rigorous administration of the Health Laws in relation to their care.

#### STREET PAVEMENTS.

Many streets, from the imperfections and irregularities in their surface, present unfavorable sanitary conditions. The old cobble-stone pavement should be rapidly removed, presenting as it does those depressions and irregularities which invite filth and promote accumulation of stagnant pools of water.

When out of repair, the damage produced upon the nervous system, to say nothing of the wear and tear of vehicles and cruelty to the animal creation, is such as to demand their substitution by a more uniform surface, and consequently better sanitary condition. Cleanliness is an impossibility in such streets.

#### FACTORIES AND WORKSHOPS

Are affording a large number of complaints, on account of the smoke, etc., thrown off, especially from those where sawdust and shavings are chiefly used as fuel.

In the Third Inspection District are several plaster mills and a lime-kiln, which are serious nuisances by reason of the minute particles of dust which escape from their chimneys, ventilators, etc., to the great annoyance of the residents of those localities, who are thereby compelled either to keep closed doors and windows, or to breathe constantly an atmosphere loaded with mechanical impurities.

#### PUBLIC FREE BATHS.

The introduction of these much-needed adjuvants to the sanitary regeneration of our population meets with the cordial indorsement of the Inspectors of the Board, who express a hope that the number will be increased until our metropolis shall offer the proper facilities for all who appreciate the advantages of personal cleanliness.

If water were made more accessible, it is believed that cleanliness would be more general, but a hardworking laborer, or his wife, or children, can scarcely be induced to use water with that freedom which is essential to health, when its use entails the additional labor of lugging it by

pailfuls up five or six pair of dark, narrow tenement house stairs.

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### FIRST SANITARY INSPECTION DISTRICT.

INSPECTOR, W. F. DENNING, M. D.

The topography of this district is not conducive to public health, for the particular reason that nearly all the ground lying west of Greenwich street is what we call "made soil" and composed of the refuse of the lower part of the city, such as dirt, ashes and garbage.

*Basements and Cellars.*—The tide percolates through this porous soil and finds its way into the basements and cellars along the water side. Many of these damp apartments are occupied for human habitations, and the tenants suffer more or less from miasmatic diseases during the greater part of the year.

*Streets.*—The streets have been kept in much better condition than in former years. Many of the old worn-out cobble-stone pavements, which always presented an uneven surface for the reception and accumulation of filth, have given way to the more modern and improved pavements of the day.

*Contagious Diseases.*—Small pox, typhus, typhoid, and relapsing fevers, together with scarlatina and measles, have prevailed to a certain extent, but generally confined to the poorer class of society, and to apartments that are damp and poorly ventilated. Typhus and typhoid fevers have been on the decrease in comparison with former years. The same can be said of scarlatina and measles.



## SECOND DISTRICT.

INSPECTOR, BERNARD HUGHES, M. D.

*Tenement Houses.*—A decided improvement is noticeable in their condition, particularly with reference to ventilation.

The halls, floors, stairways, and ceilings of these buildings are now being kept in a more cleanly condition. The walls and ceilings are more frequently whitewashed.

*Alleys, Areas, and Yards.*—The majority of the alleys, areas, and yards, are kept in a fair sanitary condition, yet there are some of the areas constantly damp in consequence of the surface water from the improperly graded yards, which soaks into the ground and eventually finds its way into the areas.

*Privy-vaults and Water-closets.*—Most of the tenement houses are provided with privies connected with the street sewer. These vaults are flushed by the waste water from the hydrant, surface water from the yard, and in many cases, also, by the leaders from the roof. Some few have water-closets in the halls or cellars. These are generally found in a very filthy condition, owing to the carelessness of the frequenters, with respect to the flushing of the closet, which too frequently leads to the obstruction of the soil pipe and consequent filling up of the hopper. When this condition of things exists, the floor of the closet is usually made the receptacle for nature's calls.

*Streets, Gutter and Curbstones.*—The condition of the streets with respect to cleanliness has been unusually good during the past summer, though many of them are so unevenly paved, that it is almost an impossibility to give a thorough cleaning. Many of the curb and gutter stones have been taken up and relaid to a uniform grade.

*Stables.*—A slight improvement is noticeable in the condition of the stables in this district, although not so marked as could be desired.

There are numerous smaller ones to be found in every section of the district which are usually located in the yards of tenement houses, the entrance for the horses being through the hall or alleyway adjoining the house; these smaller stables are generally found in a bad sanitary condition, and in most cases without a receptacle for manure.

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### THIRD DISTRICT.

INSPECTOR, S. T. MORRIS, M. D.

*Tenement Houses.*—The tenement houses are, as a rule, in a very good condition, and the complaints against them are only such as may from time to time arise by accumulation of dirt, etc.

The structural changes necessary for a *technical* compliance with Sec. 2 of the Tenement house Law have been made; but the sanitary benefit in many cases is very slight, owing to windows opening against a rear wall or in inner sleeping rooms where a cross current cannot be established.

*Factories and Workshops.*—Of these there is a large number. The smoke from them is a great nuisance, more especially from those where sawdust and shavings are the chief articles of fuel. It is constantly issuing forth in dense volumes, greatly to the annoyance and detriment of those living in the neighborhood.

There are several plaster of Paris mills and a lime kiln which are very objectionable on account of the constant escape of dust during their operations. These I consider a great nuisance and one which should be remedied.

*Public Institutions.*—I would only speak of the “swimming bath” at the foot of Charles Street. The numbers that visited this during the few months it was open attested sufficiently to its popularity, while as to its benefits the invigorating exercise and cleanliness it afforded cannot be spoken of too highly. I trust the number of these public baths may be greatly increased during the ensuing summer.

The number of cases of scarlatina I saw where the children did not go to school, and of course could not contract the disease by exposure there, were not a few. Such cases must be attributed to the prevailing epidemic influence. This conclusion is far from satisfactory in clearing up our ignorance as to the origin of the disease.

That it is not always produced by contagion, I am fully satisfied. I think I have shown how it may be spread, and I am convinced that with proper precautions it may be greatly limited.

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#### FOURTH DISTRICT.

INSPECTOR, L. DEMAINVILLE, M. D.

*Tenement Houses.*—The sanitary condition of tenement houses have improved to such a degree that it is striking, and particularly gratifying to one who has been long enough on duty in the district to judge of the difference between its past and present conditions.

The ventilation in the majority of these houses is good, showing that the second section of the Tenement House Act has been complied with.

*Garbage, etc.*—The throwing of garbage into the street gutters will not be remedied effectively until some one on

the premises is made responsible for the maintenance of its cleanliness and good sanitary condition.

*Cellars and Basements*, occupied as human habitations, are comparatively few in the district, the worst being on Tenth Avenue. Most of them have been converted into shops.

*Street Cleaning*.—The streets, some of which were in a very filthy condition, are much cleaner than usual.

*Contagious Diseases*.—During the period of time comprised in this report, small pox and relapsing fever were the two leading contagious diseases requiring the action of the Board. The prevailing disease in this district for the present is scarlatina.

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## FIFTH DISTRICT.

INSPECTOR, SIMEON N. LEO, M. D.

*Tenement Houses*, together with the condition and health of their inmates, still continue to afford ample evidence of the happy results that are manifest in people who live in cleanly, well-kept, not overerowed, and thoroughly ventilated apartments, as well as of the reverse in those few instances in which landlords and tenants failed to adopt these essential safeguards.

*Contagious Diseases*.—The recent outbreak of contagious diseases, such as measles, scarlatina, and small pox, again admonishes all classes to profit by previous lessons. In tracing the origin and history of many of these cases, it is evident that public conveyances, such as cars and stages, sometimes the school-room, vessels used for transportation of passengers, and even the poor washwoman's basket with its clean clothing, often serve as a medium of communicating the most loathsome and distressing diseases

*Slaughter-houses* in my district have been submitted to careful and constant observation. They are numerous, and represent a most important and indispensable interest in our city. Fully sensible of the peculiar nature of their calling, the proprietors have in every instance expressed and evinced a desire to comply with any suggestion or improvement that might detract from the objections raised against them; and, as at present conducted, the slaughtering of cattle, hogs, etc., is divested of much that heretofore excited censure.

*Offal Boats*.—The present system of gathering old fat, bones, etc., is certainly susceptible of improvement. The purchasing of refuse—in nearly every instance old and stale—causes many who have not the facilities or place, to hoard up large quantities of highly offensive material. In warm weather this practice was a source of great annoyance.

*Streets*, which were till recently paved with cobblestones, are being replaced by smooth and level surfaces, easily kept clean, and in every respect vastly superior to the old system with all its defects.

*Public Bathing Places*.—The introduction of public bathing places and baths, a want so long felt, has at last been supplied. At a certain time, with proper restrictions, they are thrown open, and the universal patronage received and approval met with from every source, warrant the hope that our metropolis will ere long afford proper facilities for all who desire to observe that most essential of hygienic laws, “to keep cleansed.”

## SIXTH DISTRICT.

INSPECTOR, E. H. JANES, M. D.

*Street Pavements.*—Many of the streets have been repaved, the cobble-stone pavement being removed and trap-rock pavement substituted. The material makes a very substantial pavement, easily cleaned, and, if well laid, conducive to good surface drainage.

*Street Cleaning.*—The condition of the streets in regard to cleanliness has very much improved under the present administration. The organization of a Street-cleaning Bureau in the Health Department has proved a great auxiliary to the regular work of the department, and has given general satisfaction to the public. This is seen in the greater degree of regularity with which the streets are cleaned.

*Tenement Houses.*—The requirements of the Tenement house Act are, in a majority of instances, more readily complied with. Property-owners are becoming every year better educated to the importance of proper sanitary regulations, not only as contributing to the welfare of the occupants of their houses, and thus discharging an important public duty, but as a matter of pecuniary interest to themselves by securing good tenants and prompt payments.

*General Nuisances.*—The orders of the Board for their abatement have been responded to more readily than formerly, showing a marked contrast between that obstinate resistance that was manifested during the first year of the administration of the Board of Health and the present plan of operations matured by time and experience.



*Stables.*—The condition of stables, with perhaps a few instances of improvement, is about the same as was the case last year. Several improvements have been made among the smaller establishments, such as manure vaults, where they have been recommended. But the ammoniacal exhalations arising from large stables are very annoying and offensive, and I believe that nothing short of a regular and daily use of the proper disinfectants will remedy the evil.

*Privies,* particularly those belonging to tenement houses, continue to be a great nuisance. Building the privy vault with brick and cement, and connecting it with the street sewer will, to a certain extent, relieve some very objectionable features, but in many instances, perhaps in a majority, the sewer connection is so made that it fails to carry off the contents of the vault, leaving a large accumulation to be agitated by every shower of rain, causing it to throw off suffocating volumes of foul gases, to the great annoyance of the public, detrimental alike to comfort and health.

*Slaughtering.*—The business of slaughtering has been discontinued in the Twentieth Ward, and the citizens of that Ward are not now annoyed either by the driving of cattle through the streets or the noise and offensive emanations arising from the yarded animals and slaughter-houses.

*Factories, etc.*—In my present district there are several iron works, machine shops, factories, and other establishments, in which furnaces are employed in the working of engines by steam, the smoke from which has for a long time been the cause for serious complaint. In obedience to Section 110 of the Sanitary Code, many of these furnaces have been so altered as to partially consume the

smoke, and thus in a great measure abate the nuisance. There still remains, however, much to be done in this direction.

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### SEVENTH DISTRICT.

INSPECTOR, CORNELIUS M. O'LEARY, M. D.

The most serious obstacles thus far met by the Board of Health, in its persistent efforts to raise the public health to its highest standard, have been found in the neglect of precautionary measures before certain streets were built.

*Swamps and Sunken Lots.*—The experience of the past summer has proved that no greater nuisance exists in the district than swamp lands and sunken lots. The extreme dryness of the season, coupled with the unusual heats, seems to have distilled out of these pest places a more rancorous exhalation than in former years, for the character of this summer's malarial disease was exceedingly violent, approaching often to the typhoid type. The unsanitary influence of these swamps cannot be overestimated, for they taint not only the immediate air of the neighborhood, but so fruitful are they of poison that every blast passing over them bears a burden of infection to distant points. We have the same source of miasmatic poison aggravated by the continued lodgment of water, for there is neither natural nor artificial drainage here, the tide often surging to the land level.

But the greatest evil from sunken lots experienced during the past summer was along the Eighth Avenue, on both sides, from One Hundred and Thirty-Ninth to One Hundred and Forty-Fifth Streets. Here the ruins of

old fish ponds, irregular depressions or "dips" in the land, and lots below the level of the filled up streets, have held all through the summer a nasty compound of decaying vegetable matter and animal refuse, which the tenants of the neighboring shanties and second-class tenement houses cast into them. Every evening the air is heavy with malaria, and if the theory of Herbert Spencer, in regard to the nature of malarial poison, be correct, the thick and vaporous clouds which hang over those fens at night indicate an active generation of paludal sporules.

At least no theory is needed to account for the results, for it is undeniable that the worst type of intermittent fever has prevailed all summer in the neighborhood.

*Drainage.*—Defective drainage is the root of all the unsanitary influences which curse the upper end of the island. Perhaps there is no street in the district more sadly in need of a sewer than Lawrence Street along its whole length. The street festers with animal and vegetable refuse, and the muck which prevails there in wet weather emits a sickening odor.

The privies attached not only to tenement houses, but to shanties and middle-class dwellings, were more frequently found fault with, as the absence of Croton water or the want of sewers in the streets did not allow of water-closets, and the vaults substituted therefor were often allowed to overflow.

It is impossible to apply the rules of the Board to these primitive dwellings, and the most I have been able to do was to instruct the occupants how they might conform to the general laws of health.

*Stables and Cow Sheds.*—The keeping of pigs and cows in miserable sheds attached to the shanties is another

source of unhealthiness which I had to contend against strenuously.

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### EIGHTH DISTRICT.

INSPECTOR, HENRY R. STILES, M. D.

*Tenements.*—The greater proportion of buildings in this district, now occupied as tenement houses, were originally private residences; and it is the perfect impossibility of properly adapting this class of edifices to their present uses, which renders them decidedly the worst class of tenements to deal with and keep in good order. They are, in many cases, no better than a congress of old rat holes, which defy all attempt at improvement, and which invite immediate demolition—even, if it be necessary, at the hands of public authority.

*Stables.*—Stables in my district are generally unmitigated nuisances, located in rear of, or at the side of tumble-down tenements, approached through narrow, badly-paved, and generally unsewered alleys—in some cases through the house hall-way—unfurnished with manure vault, and filthy with drainage and manure. Yet I honestly think that much of the trouble arising from accumulations of manure in stable yards is attributable to the difficulty experienced in getting it promptly and regularly removed by the contractors.

*Ash and Garbage Nuisances.*—It is very much in the same category with the much vexed question of the disposition of ashes and garbage to which sanitary experience seems as yet to have furnished no practical solution. In regard to this class of nuisances, it seems a great deal easier for the Boards of Health and Police to direct what tenants shall not do, than to suggest what they shall

do. Put a family into a space of 10x10 feet, in a back room, at the top of a five story rear tenement house, and the problems of domestic life, considered with relation to health and comfort, become infinitely more perplexing, both to them and to the public guardians of their health, than they ever could become if the same family occupied a house by themselves, with plenty of air, light, and room.

*Pavements*—My district comprises some of the worst cobble-stone pavements which were ever inflicted upon a city; and the worst paved streets are invariably those where the worse class of population is to be found. No population can maintain its self-respect in the face of foul, noisome streets, and no streets can by any amount of human ingenuity be kept properly cleaned unless decently paved, graded, and curbed; and where the streets are not properly paved and cleaned, a decent class of buildings cannot be expected.

*Contagious Diseases*.—The principal contagious diseases in my district, since I assumed charge of it, have been relapsing and typhoid—prevailing mostly in Oak, Pearl, Baxter, Mott, Mulberry, James, Roosevelt, and Water Streets—localities which, for years past, despite all that sanitary care has been able to do for their improvement, have been the recognized starting points or centres of the various epidemics which have visited our city. Removal and disinfection have been promptly carried into effect, and there seems to be little or none of these diseases lingering in these neighborhoods.

*Public Needs*.—This portion of my district presents certain conditions which have a very decided bearing upon the healthfulness of our city. The public health, no less than public opinion, demands a system of sewerage

which shall best overcome difficulties attendant upon tidal action, and the most approved pavements in those streets through which daily surges the commerce of a continent; from the Street-cleaning Bureau the systematic cleaning of streets, lanes, etc; from the Commissioners of Docks and Piers, the removal of the rotten wooden cribs which fringe our noble water front, entangling and detaining the floating filth which would otherwise be swept out to sea.

I am convinced that the health of a very large number of our business men is being undermined, slowly but surely, by defects of ventilation, heating, light, and especially by the use of underground and basement offices. The chill which constantly pervades these apartments is very perceptible to one who enters them from the outer air.

In the Fourth Ward contagious disease has prevailed to a less degree than might have been expected from the character and surroundings of its population, and especially from the neglected and abominably filthy condition of its streets during the past winter.

*Demolition of Unsafe Buildings.*—I am rejoiced to chronicle the fact that in my district, as in other portions of the city, the Department of Buildings has done good service to the public health by demolishing certain old and unsafe tenement houses and rookeries, which have for years been “plague spots,” always dangerous to life, limb and health.



## NINTH DISTRICT.

A. B. JUDSON, M. D.

A valuable result of the labors of the Health Inspector appears in the gradual education of the people to a proper estimate of the importance of ventilation, cleanliness, and light. The thoughtless cannot but receive new and lasting convictions on these subjects when they see the hand of authority vacating unwholesome cellars, removing uncleanness, and opening new windows to the light and air.

*Vital Statistics of the Fourteenth Ward.*—It thus appears that the death rate of the Ward was 25.5 in 1,000, that the death rate in houses other than tenement houses was 20.8 in 1,000, and that the death rate in tenement houses was 28 in 1,000.

In other wards, sixty-four per cent. of the population live in tenement houses, while seventy-one per cent. of the deaths occur in houses of this class.

The practical deduction from these figures is, that the first step in reducing the mortality of this ward, and of the city, is to improve the sanitary condition of the dwellers in tenement houses.

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TENTH DISTRICT.

INSPECTOR, W. H. B. POST, M. D.

*Local Superintendence in Tenement Houses.*—I would again urge the important necessity for local superintendence in tenement houses. The larger and better classes of tenement houses are generally provided with some

person who is charged with the responsibility of keeping the premises in a cleanly condition.

Thus far I have noticed a marked change for the better in such houses, which I can attribute to no other cause than the beneficial effects of the superintendence itself as the local surrounding and the character of the tenants changes very little from year to year. Very few of the smaller houses have superintendents, and the character of these tenements is, as a consequence, generally very much inferior to that of the larger ones.

*Condition of Streets.*—Up to the beginning of the past winter the general condition of the streets was a marked improvement upon that of the preceding year. But since the first fall of snow I have noticed a great degree of carelessness in street-cleaning and the removal of garbage. In many streets, particularly in those closely adjacent to the water-front, such as South, Front, Water, Cherry, and Monroe Streets, and the narrow cross streets running into them, the accumulations of garbage and every variety of street filth have been a disgrace to that portion of the city. All along Water, Front, and Cherry Streets, especially, there have been for upwards of four months past solid masses of animal and vegetable garbage, mud, and rubbish, many feet in length and breadth, and from one to three feet in height, these centres of filth having been apparently undisturbed since the snow and ice first concentrated them in masses. Many of the street gutters have been completely obstructed with ice and garbage along whole blocks for months together.

## ELEVENTH DISTRICT.

INSPECTOR, H. DE W. JOY, M. D.

*Tenement Houses.*—In Twelfth and Thirteenth streets, east of First Avenue, the class of tenement houses is very inferior. Stables and dwelling are mingled together.

Quite a number of the tenement houses outside of the above mentioned limits have a housekeeper or owner on the premises, who are responsible for the cleanliness of the building; and were this required in all cases, the sanitary condition of this class of dwellings would be vastly improved.

*Stables.*—In East, Twelfth and Thirteenth Streets, between Avenue A and First Avenue, there are several stables in groups, which should be torn down, the ground filled in and properly drained.

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## TWELFTH DISTRICT.

INSPECTOR, EDWARD FRANKEL, M. D.

*Streets.*—But, in many respects, owing to a rigid enforcement of the health laws, a marked improvement is manifest not only in the condition of the houses, but in the general appearance of the district. Several streets have been repaved, many gutters, sidewalks, and alleys have been repaired, and the streets more frequently and thoroughly swept.

*General Condition of Tenement Houses.*—A rigid enforcement of the Tenement House Law has been instrumental in improving the general condition of the houses in a marked degree, though some of the older buildings are in a very dilapidated state, the owners not keeping them in

good repair on account of the habits of neglect and uncleanness of the tenants, and the small rents received.

*Sewerage.*—The sewerage in the district is very imperfect.

*Privies, etc.*—A large number of complaints have been received against privies, and as a rule against those having sewer connections, which become obstructed owing to inadequate means of flushing and the introduction of foreign substances by the tenants. The constant use of disinfectants in privies would be of advantage in purifying the air in many portions of the district.

*Garbage, etc.*—One of the greatest wants under which the district suffers, is the absence of proper receptacles for garbage; this is thrown into the streets, yards, privies, and interspaces between rear houses, where it is allowed to accumulate. In some cases, days elapse before it is removed from the sidewalks and gutters, in the meanwhile decomposing and giving rise to foul emanations.

*Stables.*—The number of stables in the district is very large, and very few of them are kept in a clean and wholesome condition; very few have drains or direct sewer connections.

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### THIRTEENTH DISTRICT.

INSPECTOR, F. HEUEL, M. D.

*Malaria.*—The influence exerted upon the health of the inhabitants by the topography cannot be overestimated. This year has been marked by the prevalence of an epidemic of malarial fevers, and the rule has been that people residing upon or near these water-courses and ponds, or upon the sites of former water-courses or ponds, have invariably been the first to succumb to and the last to recover from these maladies.

*Streets.*—Another evil influence upon the health of this portion of the island is found in the condition of the streets. With no pavement and no general direction of slope, made, as they are in many cases, from refuse material, they themselves are foci of disease.

*Vacant Lots.*—Throughout this district there are many vacant lots, most of which are below the level of the streets. In these water accumulates, and this contaminated by refuse from the streets, stables, houses, factories, etc., forms a fluid which cannot but give rise to disease.

In this district privies retain their place to the almost total exclusion of water-closets. One of the most frequent violations which the Inspector is called upon to notice is the filthy condition of these privies. In many instances this is owing to the negligence and criminal carelessness of the tenants themselves, though more often due to the imperfect construction of the premises or to the neglect of the landlord or owner. I think the system of privies for tenement houses is far preferable to that of water-closets, since the dwellers in these houses are as a rule too ignorant and careless to take the requisite care to keep water-closets in order.

The constant personal supervision of the Inspector is necessary to prevent their filthy condition giving rise to disease.

*Dumping Grounds, etc.*—Until the present date, two great nuisances have been a source of constant complaint by the residents of this district.

I allude to the dumping grounds at the foot of One Hundred and Ninth and One Hundred and Nineteenth Streets. Here vast quantities of refuse animal and vegetable matters were allowed for days exposed to the sun, and thus to ferment and poison the atmosphere with vile

emanations. They have, however, been abolished by the Board.

In conclusion, the Inspector would state that the labors of the Board are appreciated by all intelligent citizens who see in them the means of not only preventing disease, but also of assisting people who, but for the aid thus afforded them, would be exposed to all the influences which tend to destroy them both physically and morally.

*Pavement.*—With the exception of the avenues, the pavement in this district is as bad if not worse than any other portion of the city. The gutters also need attention; many of them are so badly constructed as to prove rather a nuisance than a benefit. Any improvement in the condition of the streets would be followed, in my opinion, by a corresponding improvement in the sanitary condition of the residents.

A satisfactory sanitary condition of the district cannot be arrived at until all the streets are properly paved. Filthy streets have a decidedly demoralizing effect upon the inhabitants of tenement houses, and their whole surroundings are affected thereby.

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#### FIFTEENTH DISTRICT.

INSPECTOR, CHARLES F. ROBERTS, M. D.

*Streets and Paving.*—In respect to paving, marked improvements are noticeable in some portions within the last twelve months; as for example, the completion of the receptacle sewer on the First Avenue and Thirty-fourth Street, and the proper paving and grading of Thirty-fourth Street from Third Avenue to the river. Thirty-first Street from Second Avenue to the river, and First

Avenue from Thirty-fifth to Twenty-sixth street, are, in fact, the only portions of the district in which the general health is injured by the lack of proper grading.

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### SIXTEENTH DISTRICT.

INSPECTOR, J. FITZGERALD O'CONNOR, M. D.

The population of the down town district is very dense, and consists principally of Germans.

The keeping of small stores, saloons, petty trades and handicraft, factory work, etc., are the principal avocations. Many of the houses are of wood, particularly in Norfolk and Suffolk streets, and many of the old private houses have been converted into tenements, for which purpose they are not well adapted.

*Cellars and Basements.*—I found four inhabited cellars in the down town district, which were totally unfit for human habitation. The owners of these, on my representations and without orders from the board, caused them to be vacated and converted them to other uses.

*Garbage.*—I have never seen the order “to provide a proper receptacle for garbage” satisfactorily complied with. Refuse and garbage are still thrown into the streets, or found in all sorts of vessels along the halls and passages, and even in the bed-rooms of tenement houses. The offence of throwing garbage into the street should be punished with the utmost rigor.

*Stables.*—There are many small stables in the down town district, and very few of them are kept in a cleanly condition. They are mostly in the rear of tenement houses, and would be, even if kept in the best manner, objectionable in these localities.



## SEVENTEENTH DISTRICT.

INSPECTOR, AUGUSTUS VIELE, M. D.

A sick person could hardly be expected to get well in a place where a well person would be almost sure to get sick. And unless these drainage streams are properly provided for and protected, and unless the filling in of sunken lots and streets with garbage and refuse material is abandoned, the buildings which are erected in such localities must become permanent abodes of disease.

*Streets.*—Many streets have been paved during the year, adding much to the cleanliness of certain portions.

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## EIGHTEENTH DISTRICT.

INSPECTOR, ROGER S. TRACY, M. D.

The system of collecting the refuse from houses is either very defective or is poorly carried out in Harlem. In front of great numbers of houses, both tenement and private, are to be seen large piles of ashes and garbage, mingled with rubbish, which are not only eye-sores in an aesthetic point of view, but which are offensive to the smell, and cannot be considered otherwise than as sources of miasma.

*Stables.*—I do not feel as if it were possible to use terms too strong in expressing my firm conviction that no cow-stable should be allowed within the city limits. I do not believe it is possible to keep healthy stall-fed cows.

## MORTALITY OF THE YEAR 1870.

Twenty-seven thousand one hundred and seventy-five persons died in New York during the year 1870, a weekly

average of 522. The latest census having credited this city with a population of 942,252, the mortality based upon that enumeration was equivalent to 28.79 deaths in each thousand inhabitants.

Notwithstanding the excessive death-rate in this city during the past year, the mortality in tenement houses evinced a decided improvement over that of previous years. This amelioration has been progressive in the past three years among that class of our inhabitants which, although numbering less than half of the whole population, furnished in 1868 nearly 76 per cent. of the total mortality, a proportion which has been reduced at the present time to about 66 per cent. These figures require but little comment, illustrating as they do, so forcibly, results which can be attributed solely to sanitary reform, accruing from the efforts of the Metropolitan Board of Health and its successor, the Health Department.

It is, perhaps, impracticable by any legal enactments to obviate the domestic herding together of immense masses of people in certain portions of this city; and diseases of a special character must necessarily be rife amid this overflowing population.

But that many of the evils which have seemed inherent in such circumstances are not inevitable, but may be prevented, abolished, or mitigated by intelligent and persistent sanitary measures, is a fact which our experience has gradually and surely developed.

In 1868, 9,602 tenement houses contributed 14,550 deaths, and the charitable institutions of the city—most of whose patients come from these dwellings—4,314 more, being together 75.79 per cent. of the total mortality. In 1869, 13,285 deaths took place in 8,853 tenement houses, and 4,065 in hospitals, being together 68.94 per cent. of

the total mortality. In 1870, 8,509 tenement houses furnished 13,052 deaths, which in conjunction with 4,945 more in the public institutions, amounted to 66.22 per cent. of the total mortality. We thus discover a gain of  $9\frac{1}{2}$  per cent. within three years—or, in other words, a saving of 2,600 lives, which would inevitably have been sacrificed had they been exposed to former local insalubrious surroundings as well as to the unfavorable natural conditions of the year.

*Nativity and Ages of Decedents during the Year.*—Of the 27,175 decedents, 17,461 were of native and 9,714 of foreign birth, showing among the latter a relative increase, as compared with the previous year of  $1\frac{1}{2}$  per cent.

There were 8,383 deaths among infants less than a year old. These deaths were equivalent to nearly 31 per cent. of the total, being a relative excess of 1.42 per cent. over the infant mortality of 1869, although 2 per cent. lower than that of 1868. 1,333 deaths occurred among children less than five years of age, or 49 per cent. of the total, being a relative decrease of 2 per cent. as compared with 1869, of  $3\frac{1}{2}$  per cent. as compared with 1868, and of 4 per cent. as compared with 1867. In 1866, the number of such deaths was relatively nearly 2 per cent. less than in 1870.

This is readily explained by the fact of the comparative immunity of young children from attacks of Asiatic cholera, which in 1866 augmented the mortality among adults very considerably. Altogether therefore, within the past five years, the mortality among young children in this city has manifested a decided and constant tendency towards improvement.

There was a slight relative decrease in the mortality of persons from five up to fifteen years old during the past year as compared with the previous year, while in that of those beyond fifteen years there was an increase of about 3 per cent.

#### CESSPOOLS.

Constructions of this character, without being trapped, except for surface water alone, should be avoided as far as possible, inasmuch as they are but deposits of filthy water, the evaporations from which are necessarily injurious to the surrounding area, and where there is no sewer with which they can be conveniently connected, it would be better to provide for the flow of the waste and slops of a dwelling into the street gutters than to arrest and confine it in a cesspool.

#### SEWERS.

The great natural advantages, which our city affords, sewer drainage, have, as yet, it is to be regretted, not been as fully availed of as a due regard to the health of our citizens requires, and as a digested system of sewerage would have developed.

The leading element of insufficiency of the existing plan in a sanitary point, is that of the discharge of the sewage at the bulkheads at the head of slips, instead of at the ends of the piers, whereby fecal and vegetable matter in suspension, would be borne off by the tidal currents, instead of being deposited at the head of the slips to impregnate the air with offensive effluvia.

This latter system, however, of the discharge of the sewage of this city, is not the proper one, in my opinion, but is preferable only as being less objectionable than the existing system.

The sewage of a populous city should be received either into a basin at the terminus of each sewer, or into a line of riparian sewers encircling the city and having basins or receptacles at intervals of a quarter of mile or less, from which the sewage could be discharged into fitting receptacles, deodorized, and from them transported for utilization in agriculture.

*Depression of Gutter Stones.*—Irregularities from depression of the gutter stones of streets involve the arrest of the flow of surface water, and consequently when there are not proper sewer connections to the houses, the dwellers therein are subjected to the noxious exhalations of pools of stagnant and filthy fluids.

It occurs that a great number of tenements are deficient in connection with a street sewer, thereby involving the discharge of slops, which are frequently mixed with fecal matter, into the street gutters.

This operation is opposed to a due regard to the health of our citizens, independent of other consequences.

*Water-Closets and Urinals.*—Of the propriety of the erection of public water-closets and urinals, there cannot, in my opinion, be any difference of views.

*Cellars.*—There are many cellars which, from being located upon the river fronts, or in the course of Canal Street, East Broadway and Centre Street, are excavated to a depth below the high-water-line, and, as a consequence, when they are not floored and walled in such a manner as to resist the flow of water into them, they are frequently flooded and always damp. In the default of rendering such places water-tight, and in the absence of a sewer at the river front, designed for such purpose, they should be compactly filled in with fresh earth.

## FROM THE REPORT OF J. C. NOTT, M. D., ON YELLOW FEVER. .

Yellow fever, which is not generated in the human system, or transmitted from one person to another in any way, but whose germ or poison is generated *outside* of the human system, and is taken in after the manner of marsh malaria poison. But, unlike the latter, its *germ* is *portable*, and may be carried in vessels, trunks, baggage cars of rail roads, etc., from one point to another, and thus propagated.

Marsh malaria fevers, which are strictly epidemic—of local origin—not contagious and not portable.

Marsh fevers present a very striking contrast when compared with the class of contagious diseases above referred to, and obey very different laws.

As the name implies, they arise from external, terrestrial poisons, but whether organic or inorganic is still a question. The professional mind, it must be confessed, is at present strongly leaning to the germ theory, and particularly that of vegetable spores, which, taken into the system, act as poisons. It is not reasonable to suppose that germs of this kind—like those of contagious diseases—are *reproduced in the body*, as they are not communicable by contagion, nor portable, and may be avoided by removal from the *place* where the cause is generated.

“The poisons of tropical fevers especially require to be carefully studied, and the phenomena of the febrile state which accompanies them, embrace medical problems of the most abstruse character.”

REPORT ON SANITARY ENGINEERING. BY EGBERT  
L. VIELE.

It is a well established fact that the principal cause of fever is a humid, miasmatic state of the atmosphere, produced by the presence of an excess of moisture in the ground, from which poisonous exhalations constantly arise, and carrying into the system of those who inhale it, a virus, which, if not sufficiently intense to produce fever, has such a disturbing effect upon the functions of some organs as to weaken the general system, and act as a powerful predisposing cause of some of the most common and fatal maladies to which the human body is subject.

One of the chief causes of mortality is to be found in the defective drainage of certain districts of the city.

Along the lines and original courses of all the original drainage streams, there have been placed in the grading of streets and construction of dwellings numerous obstacles to the free flow of water through its original channels. The consequence is an accumulation in different localities of deposits of stagnant water, which in itself, is not only detrimental to health and productive of epidemics, but by reason of accumulation, it causes the saturation of an extensive area of ground, permanently unfitting it for building sites, since no houses can be located within this area of saturation without being affected by dampness to a greater or less extent.

The very heat with which the occupants of houses so situated seek to draw off this dampness only aids, in the end, the capillary force which is always at work.

As a result of this disregard of nature's simplest laws, and under a criminal combination of ignorance and



neglect, we have constantly present the various forms of intermittent, typhus, and typhoid fevers, consumption, scrofula, and all the diseases attendant on the atmospheric conditions which are due to this source.

In a large hotel located over an obstructed water-course, repeated cases have occurred of typhoid fever, followed by death. A number of the most costly dwellings in certain portions of the city have been abandoned by the owners, as residences, after the death of members of the family from this cause.

In the face of such testimony, can neglect to provide the necessary remedies against an accumulation and extension of this evil be regarded in any other light than criminal?

The blocks and beds of streams are constantly being filled in with earth, sometimes with refuse garbage and other material causing a permanent deposit of decomposing organic matter, which for all time remains to add a fetid character to the damp exhalations which arise.

Along the courses of these streams, numerous factories, slaughter-houses, breweries, shanties, and stables are located, discharging into them liquid refuse, overflow of privies, cesspools, etc. showing a reckless disregard of every law of health, and every principal of sanitary science.

One institution has made use of a stream originating near it as a receptacle for all its liquid refuse. Crossing Ninth Avenue, it becomes a long stagnant deposit of water. Along the entire extent of this dirty and disgusting deposit, the most sickening odors are perceptible, and fevers are constantly prevalent, the inhabitants complaining most bitterly of the scourge they are constantly exposed to.

The brewery at Ninth Avenue and One Hundred and Seventh Street is a similar instance, in which a large area of ground is saturated with liquid refuse, emitting the most offensive odors.

From these two causes alone, this whole section of the city is really unfit for residences at this time, and any one attempting to reside there would be exposed to malarious disease.

The remedy to be applied should be searching and comprehensive.

As an example of the manner in which a drainage stream may be a permanent source of disease, I will cite the instance of one which rises near Fourth Avenue, between Ninetieth and Ninety-first Streets. In its course it runs under a row of houses on Ninety-first Street, where it is converted into a receptacle of sewage; the consequence is that in all these houses typhus fever prevails, and the lower portions cannot be occupied at all. Nearly all of them have been vacated.

#### WATER SUPPLY.

Without an adequate supply of water no city can be clean or healthy to say nothing whatever of comfort.

Water alone can remove the thousand impurities which are inseparably connected with a large population. The past year, serious alarm was felt in many of the large cities in regard to the diminished supply of water. Boston, Philadelphia, and Brooklyn suffered more than New York.

Much of the sickness which prevails in malarious districts, may be attributed to the impurity of the water which, through infiltration, becomes tainted with vegetable decomposition.

The conditions of a perfect pavement are, a light grade, easy traction, and a good footing for horses. It should be so constructed that water could not percolate through or under it, so that it would not be liable to get out of repair, and so that any portion could be readily taken up and replaced without impairing its stability.

The only pavement fulfilling all these conditions, combined with durability in the material, is the concrete pavement, or small cubical blocks of primitive rock laid upon a bed of concrete.

The ordinary cobble stone pavement is a mere temporary expedient.

*Ventilation.*—Vitiated air whether it be the result of animal or vegetable decomposition, or produced by respiration, has always been the most prolific source of disease.

So dependent are the functions of life on the purity of the air we breathe, that it is utterly impossible for a human being to inhale impure air, under any circumstances, without a loss of physical health proportionate to the degree of contamination existing. And it is in a great measure owing to the ignorance existing upon this subject that so few persons can ever be said to feel perfectly well.

Not only are the bodily functions disturbed by impure air, but the mind feels its direct influence, especially in crowded assemblages, causing stupor, headache, nausea, to say nothing of its after effects.

Yet no subject is less understood, or has received in architectural constructions, public and private, less attention than ventilation, while it should be in reality the first to be considered.

Every building erected for the use or occupancy of human beings, no matter for what purpose, should be provided with an adequate system of artificial ventilation. In nature's grand and harmonious organization, countless and ever-varying currents of air serve to dilute and neutralize the deleterious gases, which the incessant decomposition of organic matter causes to be evolved, and thus preserves the surface of the earth for animal existence.

But in a confined dwelling these life-saving currents are shut out, and the ever active power of air, deprived of the necessary circulation, develops the most subtle and destructive poisons.

How essential, therefore, that, by a clear understanding of this subject, our reason, in the absence of visible testimony, should direct action in a matter so important to human health. More particularly in large cities.

It would be safe to assert that in all this great city, with its million inhabitants, there are not one hundred buildings, either public or private, that can be said to be well ventilated, and, therefore, nearly every inhabitant is at this moment inhaling impure air. The pallid face, the hectic cough, the lassitude of body and loss of energy, are all the accompaniments of impure air; and vice and crime, so often associated with poverty and want, seem also inseparable from vitiated atmosphere.

There is an institution located in the upper part of the city, which is an example of the general want of information which exists on the two important subjects of drainage and ventilation.

There is no general system of ventilation provided, and every room is deficient in this particular. The entire sewage of the institution has been suffered to

flow in an open channel in a ravine and to empty itself into a slough, of about an acre in extent, at the foot of the ravine, which, although occasionally overflowed by the tide, is every day exposed to the direct action of the rays of the sun, and a black foetid mass of decomposing matter generates incessantly malarious gases, which has had the effect to prostrate a large number of the inmates with typhus fever. It is believed that no more effectual method could possibly be conceived of to produce this result, and it is hoped that the publicity given to this matter, will have the effect to cause the managers of similar institutions to examine more closely these important subjects and supply the omissions which they also may be suffering from.

The course of remedial action most readily and effectually introduced at this time that occurs to me, is the effective cleaning of our streets and piers, in order to remove the wash into the rivers therefrom, and putting an end to the present practice of depositing the dredging of our slips into the channel of the rivers.

The opinion appears to prevail with the public that the discharge from our sewers and the deposit removed from the slips into the sewers, are *washed*, as it is termed, into the sea and Long Island Sound.

Instead of this being the case, the slips of this city are very rapidly being filled, the bays, indentations, and flats upon the shores of Long Island and New Jersey, the Harlem River, and all places where the currents are comparatively feeble, are being rapidly silted up by the tidal currents.

That by the thorough cleaning of the streets and piers of this city, Brooklyn, and neighboring cities, the deposits into the slips would be lessened, and the necessity for dredging them would be rendered less frequent.

The contour of the city, bounded by rivers on all sides, meets the problem of arresting its sewage at the embouchure of the sewers, under the most favorable circumstances for removal and utilization, for if there was constructed a line of sewer along the river fronts, with receptacles at such frequent intervals as would give the necessary inclination to them to afford the flow of the sewage into them, the entire sewage of the city would be received therein, from which it could be taken up into suitable vessels and transported to be utilized in agriculture.

The result of the deposit or discharge of the sewage into our docks or slips, involves both the sanitary requirements of a populous city and neighborhood, and the injury of the harbor.

Of the injurious effects of the sewage being deposited into a river, I submit the following :

The sewage of Towns Commission of England, in their report of 1858, make the following statement :

“ The discharge of a large body of sewage into a river is frequently not only productive of nuisance and disease to the neighborhood where it takes place, but its influence extends to distant populations.”

And in their report of 1861, they further state :

“ With regard to the Mersey, there is said to be evidence already that the bed is raised—that the deposit has permanently much increased. At Bath, the discharge of sewage into the Avon is said to have so increased of late years as to impede navigation. The drainage of Glasgow is stated to produce deposits in the harbor of the Clyde at the rate of 100,000 cubic yards yearly, and to entail an expense of £ 8,000 per annum for its removal.”

In order to illustrate how fallacious is the received opinion that our rivers carry all sewage matter to the sea, it was clearly shown, by the repeated experiments of these distinguished engineers, that in the river Thames, sewage discharged into it two hours after high-water, reached the same point upon the next flood-tide, that sewage discharged into it two hours before the previous high-water.

The prevailing opinion of writers on relapsing fever is that it is peculiarly a disease resulting from overcrowding and destitution, while typhus is a disease which finds its exciting cause in overcrowding alone.

The experience of the medical officers of this Board during the recent epidemic, would seem to confirm the previous opinion as to the chief factor in the causation of relapsing fever, viz: destitution. The fever clearly sought and found its victims, by preference, among that homeless class of people who wander about the city by day, eating the food which they beg from door to door, or pick up in the streets, and who crowd together at night in damp and filthy cellars, and unventilated apartments.

This was a matter of daily observation by the medical officers. The disease never showed the slightest tendency to prevail among the better classes. During the entire period of its prevalence in New York, eighteen months, the upper and middle classes of society enjoyed perfect immunity. It prevailed as an epidemic only among the vagrant and destitute.

For the information of the medical officers of the Board and of public institutions, and to secure prompt action, the following memoranda were issued under the direction of Dr. Harris, Sanitary Superintendent:



“The ‘relapsing fever,’ though contagious and infectious, and consequently requiring the entire separation of the sick from the well, this fever is so particularly a disease that can spread dangerously only by the aid of overcrowded, badly fed, and uncleanly people, that wherever the health of these classes of the poor is properly protected, and the sick removed and well provided for, and their unclean and infected houses are purified, the fever will cease to spread.

“An attack of relapsing fever is greatly less dangerous to life than an attack of typhus. But when relapsing fever has attacked, and when all its acute symptoms are past, the sufferers remain for awhile extremely weak, requiring that food and restoratives should be liberally supplied them; in default of which the feebleness left by the disease may often be of indefinite duration.”

EXTRACT FROM CIRCULAR OF MEDICAL OFFICER OF PRIVY  
COUNCIL, ENGLAND.

“Medical officers of the Metropolitan Board of Health are required to make a thorough inspection of every inhabited cellar, and of the entire tenement house district under their care respectively, and as often as once in each week to make a searching tour for re-inspection through those tenement house regions where this fever is most liable to become prevalent. All uncleanly cellars, lodging-houses, alleys, rear yards, and badly crowded or filthy tenements should be reported, in official form, upon the day the inspection is made; and forthwith, whatever the Board of Health and the Sanitary Superintendent can do to apply or execute the needed sanitary measures, will promptly be ordered and carried into effect.

“Every medical officer and every agent of the Board of Health on sanitary duty in any portion of the Metropolitan District, is hereby instructed to advise the poor and destitute classes of inhabitants, especially those in crowded and unclean tenements, wherever such people are found, to keep their apartments ventilated and to cleanse and whitewash all bed-rooms, halls, and closets; and especially to direct them to give information to the Board of Health, without delay, whenever any person becomes sick in their tenements.”

In relation to remonstrances of citizens against the continuance of fat-melting at the foot of Forty-Fourth Street, &c.

Repeated inspections during the summer months of all the slaughter-houses, the fat-melting establishments, the rendering places, the dumping grounds, and similar locations and occupations, furnishing a constant source of complaint to the citizens and public press, and causing no little annoyance to this Board, have convinced your Committee that, short of a thorough reform in the location and management of these various occupations, no satisfactory result can be arrived at. Unless all the slaughtering of which offal rendering, fat-melting, tripe-boiling, gut-cleaning, etc., are but the natural offspring, instead of being carried on at about sixty different places, can be concentrated in a few large abattoirs, as has been done in other great cities, there will be no abatement in, or relief from, the constant complaints against what are generally termed nuisances. All efforts of this Board to improve matters in this direction must prove unavailing as long as there is not a proper public spirit evinced on the part of the press, the citizens, and those directly concerned, to aid it in its contemplated reforms. It is

shocking to see how little correct information and sound judgment in the discussion of these various subjects is generally evinced.

It is practically impossible to render "fresh fat only," while half a dozen or a dozen such establishments have to be supplied by sixty smaller or larger slaughter-houses with the raw material. Throughout the warmer seasons a large proportion of the fat from slaughtered animals must necessarily and speedily become tainted ere it can reach the melting tank, and all technical or chemical contrivances cannot wholly do away with the nauseous smell created by the melting of the once tainted fat.

All the offal and other refuse animal matter, from whatever source, and all fallen animals, should be speedily forwarded to a rendering place, so situated, arranged and managed, as to give no reasonable cause for complaint to the neighborhood.

For the better elucidation of this subject, I give the following condensed replies of the resident physicians of the towns in Massachusetts in response to inquiries made in 1870, by the State Board of Health of Massachusetts :

*Blackstone.*—"The diseases most prevalent are those of the lungs and inflammations of the mucous membrane generally. The mortality among our foreign population is large, more particularly among children. Very much sickness can be traced to a want of proper sewerage and the neglect of cleanliness and ventilation."

*Dudley.*—Lung diseases are most prevalent here ; pneumonia, pleurisy, bronchitis. I think that cases of consumption are rather more frequent than in adjoining towns. I cannot account for it unless it is from the wet soil. The subsoil is clay. Location, high and exposed to wind.

*Fall River.*—Consumption, catarrh, dyspepsia and nervous diseases are prevalent. The first two are due, in a certain degree, to the localities. The town is exposed to cold, damp fogs, and has a large body of fresh water on the east, and Narragansett Bay on the south-west. Soil wet and impervious to water. Consumption is very prevalent among the foreign population, who have not the slightest knowledge of hygienic laws, who live in a crowded condition in the midst of filth of all kinds, and sleep in poorly ventilated rooms. These conditions are perhaps even more conducive to consumption than the location of the city.

*Groton.*—Influenza has been very prevalent from atmospheric changes. A prominent cause of consumption is the want of ventilation in houses. As soon as cold weather comes, people shut up their houses as tight as possible, and then, with stoves, heat them to such a degree that they become very sensitive to cold on going out of doors.

*Hinsdale.*—“Scarlet fever has been very prevalent and fatal in this town during the past year, and has been confined almost exclusively to the foreign residents—operatives in the mills. Why the disease should be restricted to this class of our population I cannot explain, unless it be from their crowded tenements and less cleanly habits.”

*Hudson.*—“We have not been free from scarlet fever since the autumn of 1866. The site of the village is low, but with a dry and pervious soil. In the hot season the purity of the air is somewhat affected by decaying vegetation in surrounding ponds.”

*Newton Centre.*—The only disease which has a marked prevalence is dysentery, and that is almost exclusively confined to a region southwest of this village, bordering on an extensive peat swamp, and drained by a sluggish

creck. A fatal epidemic of diphtheria prevailed in this same region six years ago.

*Plymouth.*—In the south part of the town, along the basin of a small river, flowing into the adjoining sea, consumption is frequent. The soil is in this basin low and wet.

*Pittsfield.*—Houses too much shaded. [See under head of “Typhoid.”]

*Reading.*—Consumption very prevalent. Our correspondent says: “I cannot account for this prevalence except from dampness, and this is only partially removable. Much of the land is low, level and wet, and much of the higher land is retentive of moisture. In spring, many cellars are partially filled with water for a considerable time.”

*Rehoboth.*—Pulmonary affections most prevalent. The acute forms of these diseases occur during the breaking up of winter. Consumption generally hereditary. The soil where it prevails is wet, impervious to water, and low in situation. Air rendered impure by stagnant water in large swamps. People persist in living in the worst parts of their houses, and where the sun does not come, and thereby do injury to their health.

*Stow.*—In the lower portion of Assabet village there were last autumn a good many cases of typhoid fever, and they were confined to that portion of the village which is built upon a meadow which has once been cut over for its peat, and left to fill up again. But this is not the whole story. They build their privies and pig-pens near their houses, and their sink drains add to the accumulated filth.

*Stoughton.*—Our correspondent has practiced in the town for forty years. He says: “Traveling westerly from the centre of this place, two miles on a street where

there are perhaps two hundred persons, I find the oldest of them is seventy. Going the same distance in the opposite direction, there are about the same number of people, but I find three couples all over eighty, and three widowers aged from eighty-one to eighty-five. I know of no essential differences in the situation, except that the land where the older persons live is considerably higher, and I should judge more pervious to water.”

*Salem.*—Consumption very prevalent, and due, in the opinion of our correspondent, to three causes, chiefly: 1st, the character of the soil; 2d, want of proper drainage; 3d, exposure to harsh winds.

*Stoneham.*—“Scarlet fever the only disease which seems to be prevalent. For the past fifteen months it has been present. Cases of an extra severe type have occurred in well to do families as frequently as in those of the poor. Principal sanitary deficiency of the town is want of drainage.

“In some boarding houses in this town, six or eight persons occupy a small bedroom, and it is quite common to find four in one room, say thirteen by fourteen feet.”

*Taunton.*—“Diseases of the respiratory organs have been unusually prevalent during the past winter and spring.” Tubercular affections are constantly under the care of our physicians. The land is swampy and the drainage very imperfect. The city is built on the banks of the river, and when the tide is out the surface of the water is not more than four or five feet below the adjoining land. All the houses are built with cellars six or seven feet below the surface of the land. These cellars have from six to eighteen inches of water in them for a considerable part of the spring.

“It is a prevalent custom to keep the window-blinds



constantly closed, thereby excluding sunlight. The furniture and closets are damp in wet weather.

*Topsfield.*—Consumption prevalent. “Special cause found in wet soil, which may be improved in some degree by drainage. The soil of the hills, as well as that of the lowlands is wet.

“Air has been rendered putrid by the emanations from slaughter-houses which have existed many years in and near the village.”

*West Newbury.*—“The soil a clayey loam, impervious in a great degree to moisture. There are few cellars in town that have not water in them during the wet season, and they are almost always damp. The consequence is that consumption in its various forms finds many victims. In the westerly part of the town is a swamp two miles long and a half mile wide, which produces wood, or if cleared, an inferior grass. The condition of the town, as regards both health and prosperity, would be improved by thorough drainage.

“Air is rendered foul in the neighborhood of comb-shops from the pith of the horns of slaughtered cattle. This is taken out and put in piles, making an almost intolerable odor, and constituting a nuisance which ought to be abated.”

*Wakefield.*—Two severe epidemics of dysentery have occurred in the past six years, coming on when the surrounding bogs were dried up. Soil usually very wet. Cellars have more or less water in them nearly all the time. Houses are damp—much mould observed in them. Both epidemics of dysentery were preceded by an epidemic of scarlet fever.

*West Boylston.*—Typhoid fever rather prevalent, and has been for more than twenty years. Cause not obvious.



A river town with interval lands ascending to beautiful hills. Most of the wood cut off. Soil pervious in some parts, impervious in others; somewhat springy. Interval lands not well drained. Drainage, much neglected.

*Westborough*.—"Situation of village low as in a basin, shut off from winds with dry soil and sub-soil of quicksand. Typhoid fever and consumption much more rare than on the exposed hills around us, where the ground is wet from a clay sub-soil."

*Wrentham*.—This region seems to be remarkably conducive to health; elevated, well drained, good water. Excellent natural sanitary advantages; of course, some minor artificial nuisances exist; little attention is paid to the condition of cellars; drains and privies are often in too close proximity to wells, giving rise to dysentery and typhoid.

*Weymouth*.—Diseases of respiratory organs prevalent; due in great part to location of village; exposed to east and north-east winds. Soil clayey and moist. "Bone factory does not tend to purify the air."

*Westhampton*.—Regarded as an exceedingly healthy town. Soil loose and stony. Good elevation. Very hilly. Excellent drainage. Our correspondent is informed that scarlet fever, although often present, has been for eighty years past non-malignant, and his observation in recent years confirms it.

The following replies from the places named are an answer to enquiries as to the cause of typhoid fever.

Among these enquiries are the two following:

Have you observed any connection between typhoid fever and foul soil, whether from privies, pigsties, manure heaps, or similar collections of decomposing matter lying on the ground.

The replies from 79 places was. Yes.

“ “ “ 45 “ “ No.

“ “ “ 39 “ “ Doubtful.

Have you observed any connection between typhoid fever and putrid air, whether from rotting vegetables in cellars, bad drains, unventilated living or sleeping rooms, or from any other cause?

The replies from 90 places was Yes.

“ “ “ 36 “ “ No.

“ “ “ 37 “ “ Doubtful.

*Attleborough.*—“ In localities where typhoid fever prevails, foul soil or foul air, under conditions corresponding to questions three and four have almost always been detected.”

*Amherst.*—“ Typhoid fever is a common disease here.

I have now in mind a house where, at one time, fever seemed endemic. The cause was found in decaying vegetables and filth in the cellar. These being removed, the disease disappeared.”

*Ashland.*—“ The most unhealthy part of our village is not on the plain but is a street extending along the south side of a hill. During the past two years there have been cases of typhoid fever on this street quite out of proportion to the number of inhabitants. Two years ago this location was a piece of woodland. It was cleared, and ten tenement houses, erected on it for the accommodation of twenty families. The land is springy, and water stands in the cellars of these houses five or six months in the year. From the land having been so recently cleared, there is much decaying vegetable matter on the ground and in the soil.

“We may consider the practical facts presented in this connection to be these: That quantities of decomposing

matter, whether from pigsties, privies, vegetables in cellars, or *decomposing leaves of newly cleared land* combined with *dampness* and deficient ventilation may be among the causes of typhoid fever."

*Athol*.—"Typhoid fever has not prevailed to any great extent during the past eight years. Most of the cases have been in a certain part of Athol proper. In this locality the land is very high, the soil cold, thin and marshy; no running water, no drainage. There is no known impurity in the well water. Connection has been traced in this locality between typhoid, and foul soil and air."

*Beverly*.—Our correspondent reports ten cases of typhoid of a very severe type, occurring in one family, in November, 1865: The house stands near the ocean, but on a hill seventy feet above high water mark.

The hill slopes in every direction from the house, and is mostly rock. The house is built on rock, is large and airy. The cause of the fever was found in the following circumstances.—The privy was only about eight feet from the house and exceedingly foul. The sink spout ran into a hoghead, and the odor from this and the ground immediately about it was intensely putrid.

*Berkley*.—"There is one house where typhoid fever has been more prevalent than any other in the town.

Soil dry, gravelly and sandy; on the south is a course of swamps with water sometimes a little stagnant; on the north is a deep pond-hole with some vegetation growing in it, quite near the house.

When in the fall of the year the wind blows for some time from the north-east across the pond-hole, I expect typhoid fever in that house, and I have not often been mistaken. I have observed this for the past twenty-six years.

*Brookline.*—Although I believe in the necessity of careful drainage, I must say that I have never had cases that I could attribute to bad drainage, but many that I could trace to decaying vegetables in cellars.

“In 1846 or 1847 a serious and malignant epidemic of typhoid dysentery raged on Bradlee’s Hill, and in the houses in the vicinity of the reservoir, then in process of construction, in a locality which in other years had been healthy. At that time I attributed the epidemic to the turning over and exposure to the air of the meadow mud filled with decaying roots and other vegetation.

*Boston.*—The older parts of Boston are more filthy from overflowing, neglected and broken privy-vaults, than any country place can possibly be ; but they do not contaminate the drinking water.

The influence of obstructed drains and of emanations from untrapped sinks and water closets is as evident in Boston as elsewhere. In Kearsarge Avenue, Boston Highlands, is a block of three story brick houses built seven years ago. They are situated on the slope of a hill, with good natural facilities for drainage.

The neighborhood is an excellent one. In these three houses there occurred in the autumn of 1868 eleven cases of typhoid fever ; and in the adjacent houses whose rear came against the block, there were two cases.

Of the thirteen cases, two were fatal. One of the attending physicians states that at his suggestion the common sewer of the block, which was laid along the rear of the houses, and into which the drains of the houses emptied, was examined. It was found to be effectually obstructed by a mass of rubbish, including crockery, tin-ware and ashes, so that the fluids accumulating above this plug had overflowed, saturating the ground beneath

the houses, and infecting also in some degree, the soil beneath the adjacent block. The workmen engaged in taking up the drain and repairing it were nauseated and were obliged to desist at intervals from their work.

The physician stated further, that the typhoid epidemic in that neighborhood subsided soon after the nuisance was abated.

*Brimfield.*—An experience of twenty years has satisfied our correspondent that the most prolific sources of typhoid fever are found in the conditions mentioned in the third and fourth questions. “Many and many a time” he has traced such connections.

“We have every year a few cases of typhoid fever, and in nearly every family where it has occurred in the past three or four years, I have thought it originated from decaying vegetable matter.”

*Bridgewater.*—“Whenever I have had several cases of typhoid fever in one house or neighborhood, I have usually found what I considered the cause, either a wet cellar, with decaying vegetables, or a sink drain running into a pool near the house for the purpose of making compost.”

*Brewster.*—“Typhoid fever has in some instances seemed to be caused by bad drains, but in my opinion by far the most fruitful cause has been the emanations from low, wet, swampy grounds, and fresh water ponds, of which the bottoms were partially exposed from evaporation in dry seasons.”

*Chatham.*—“Most of the typhoid cases were in the adjoining town of Carver, which is interior, and where there is much fresh water and low meadow land.”

*Conway.*—“According to my observation, putrid air from decaying vegetable matter and foul sink-drains, with

poorly ventilated sleeping room, constitute the most frequent cause of typhoid fever."

*Coleraine*.—"I think the bottoms of mill ponds in times of drought are fertile sources of typhoid fever."

*Dartmouth*.—"My experience is that typhoid fever prevails in its most malignant form in low, damp places, where rooms are but poorly ventilated, where cellars are overflowed, where drains are bad, and where decaying animal and vegetable matter is found in and around the building."

*Dennis*.—"In a neighboring town I have seen well marked instances of typhoid caused by partially draining a swamp."

*Dudley*.—"Our correspondent has observed an apparent connection between wet cellars and the habit of sleeping on the ground floor, and the origin of typhoid fever."

*Ewing*.—"Last August three persons in one house died of typhoid fever. The cause seemed to be a pool of stagnant water and decaying vegetable matter within thirty feet of the house."

*Fall River*.—"In the autumn of 1867 about forty cases of typhoid fever occurred in one locality where a large number of houses had been recently built, and filled with French Canadians as soon as completed. The water was from wells just dug. Every form of filth was thrown on the ground and left exposed.

"The following year a large number of cases of fever occurred in another neighborhood. Here also the houses and wells were new. An examination of the premises showed that the pipe leading to vaults containing refuse matter and filth of all kinds, was so arranged as to allow the foul air to escape directly into the houses. These



pipes were properly trapped, and no cases of typhoid have since occurred."

*Great Barrington.*—"Whenever called to a case of typhoid fever, I have been able to trace the origin to some local cause in every instance." The above opinion is the result of twenty years' practice. Our correspondent is very decided in the expression of his opinion that foul soil and air and water are the causes of typhoid fever.

*Grafton.*—"I have noticed that a connection between typhoid fever and foul soil seems to exist, occurring more generally and assuming a more grave and malignant type under these circumstances, sometimes seizing a whole family, or even many families in a neighborhood, until the cause was abated. Many cases, not only of typhoid, but of dysentery—the latter, perhaps, especially—have originated in foul soil and putrid air within the range of my practice."

*Gloucester.*—"I have always found typhoid fever most prevalent and malignant where the air has been rendered impure from the causes enumerated in the fourth question of the typhoid circular."

*Hadley.*—"Some twenty years ago I attended upon a family consisting of a father, mother, and nine children. The mother and eight children had typhoid fever. After the first case of fever, four of the children, who showed no signs of illness, were placed in as many different families, three of them being at a distance of two or more miles from their home. They, however, exhibited signs of the disease as soon as those remaining at home. As to the cause—there was a slaughter-house at the distance of one-third of a mile from the house. The proprietor had spread the accumulation of his hog-yard with the butchers' offal upon a low, wet piece of ground lying



between his buildings and the house of his neighbor. Whenever the Northwest wind blew the stench was perceptible to all in the vicinity. I noticed it many times riding by. I have always believed that the fever must be attributed to the influences proceeding from the manured field above mentioned.

“Thirty years ago, a clergyman built a house in this town, with a fine cellar, extending under all portions of it. He dug a well under the L portion. The well was not covered, and consequently the floors of all the lower story were kept damp by evaporation. The sink-pipe ran down near the pump into a wooden spout, which passed under ground to a closed box, situated about fifteen feet from the cellar wall. The foul air from the box and drain had no means of escape, excepting through the drain back into the cellar. The cellar was also used for the storage of whatever vegetables were used in the family. The windows of the cellar were never taken out. There was no escape for the moisture and foul air; except by permeating the floors. Water stood in drops upon all the timbers and boards.

“After a few months residence in the house, the minister’s wife died of fever. He soon married again and within one year of the death of the first wife, the second died from the same disease. His children were also sick. He lived in the house about two years. The next occupant was a man named B—. His wife was desperately sick. A physician then took the house. He married, and his wife died of the fever. Another physician was the next occupant, and he, within a few months, came near dying of erysipelas. All this while matters had remained as before described, with reference to ventilation. A school teacher then rented the house, and tore

up the closed box, but did not cover the well. This was about eight years after the building of the house. The sickness and fatality were so marked, that the property became unsaleable. When last sold, every sort of prediction was made as to the risk of occupancy, but by a thorough attention to sanitary condition, no such risks have been encountered.

“In North Hadley is an extensive millpond. About thirty years ago the water was drained off to make repairs during the summer. It had islands and many shallow places, on which there was a rank vegetable growth. There was consequently much decaying material from the exposure. Typhoid fever swept through the village, causing great mortality. No one here has ever questioned the fact that the drainage of the pond was the cause.

*Huntington.*—Our correspondent states that typhoid fever is a very frequent disease, and is decided in the expression of his opinion that it may very commonly be traced to some foulness as the cause.

“In the winter of 1868 I attended six cases of typhoid in one house, on high and dry ground with good cellar and good water. I found no privy. The family for two years had made use of the vacant lot in the rear of the house. No other cause for the disease was found; this seemed sufficient.”

The autumn and winter of 1868 gave me fifty cases, about equally divided between the villages, and the country five miles around. I have usually found, on close investigation, some immediate and direct local cause on or about the premises. Our cellars are many of them damp, sinks foul, and the people blind to the importance of these things. In 1867, in one house

where there were nine cases of severe fever, a drainage from a wet sink, into which all the slops were thrown, had established itself to the well from which the water from drinking and cooking was obtained. In nearly every case some local cause was ascertained, in some instances apparently slight."

*Hudson*.—We had a great number of cases of typhoid fever, and typhoid dysentery six years ago, caused, as I suppose, by the decaying vegetable matter from a pond in the village, which was drawn off for the purpose of repairing a dam. "Wherever I have seen typhoid fever in ill-ventilated rooms, or where the surroundings were foul, the fever has been of a low type, and has proved most fatal."

*Hanson*.—"I have found typhoid fever to be more prevalent in low, wet and foggy locations, and have sometimes been suspicious of the influence of the foul cellar."

*Hyde Park*.—Typhoid fever, a disease of common occurrence. Have found foul privies on the premises, where repeated and fatal cases of typhoid have occurred, but have not always so found them.

*Kingston*.—I had five cases in one neighborhood last year in houses supplied with spring water. Also two other cases in a house, with a wet cellar and near a mill pond, which had been drawn off.

*Lenox*.—"Nearly every case of typhoid in my practice can be traced to foul privies, decaying vegetable matter, obstructed drains, or wells below the level of cesspools, privies or manure heaps."

*Leominster*.—The fourth family consisted of boarders forty-one in number, operatives in a woolen mill. Twenty-two were within a few days seized with typhoid

fever. The cause of the disease in this instance was apparent. The drain of the sink had found access to the well. A new well was dug and no more cases occurred. For the last thirty years I have observed that typhoid fever prevailed here most extensively in those years in which the summer was dry, followed by a wet autumn."

*Leverett.*—Typhoid fever is an annual epidemic in the village probably caused by a cider-mill, where the pomace from the apples is heaped up yearly and left to ferment; in the hot season, with a west wind, the odor can be perceived throughout the village. There is now a great mass of this pomace which has been accumulating for years. There is a good deal of fever in this section of country, but more in the village than in all the rest of the town.

"An epidemic of typhoid occurred here some time since from the flooding of a meadow, and then draining it. After it was drawn off every family living around the pond had typhoid fever. I have observed that if one member of a family is attacked, some of the others are almost sure to be, if the rooms are small and ill ventilated. Among the causes of typhoid which I have observed, may be mentioned, slops thrown on the ground, putrescent puddles from sinks under the window, rotting vegetables in cellars. Typhoid is often caused by decaying vegetation ceasing after a hard frost. I have had cases occur after digging muck in swamps, and working around ponds that were drying up.

"Two years ago three boys went in swimming in a foul pond of water. In just two weeks afterwards they were all taken down with severe typhoid fever."

*Littleton.*—"I have observed that typhoid fever has assumed a graver type when the cases have been near a

slaughter-house. It seemed to be aggravated by the impure air arising from the decomposing animal matter."

*Lawrence.*—"Many cases of typhoid fever occur in overcrowded and ill-ventilated sleeping-rooms, as from all the causes mentioned in the fourth question."

*Lowell.*—"If one may deduce any conclusion from the mortality in Lowell in a single year, it would appear that though filth, putrid air and impure water are active agents in causing scrofulous, tubercular and bowel diseases, they have but little, if any effect to cause typhoid fever. I have in mind instances where it seemed to extend itself by contagion.

*Lexington.*—"I had eight or ten cases of typhoid fever in 1865, in a circle twenty rods in diameter. I noticed that within this area sinks disgorged their filth on the surface of the ground close to the houses, the privies had no vaults, the excrement lying on the surface of the ground; a pigsty was an invariable appendage to each house or shanty, and often the house formed on one side of the sty; the weather was unusually warm, and the stench horrid. At the same time a large piggery from twenty to forty rods distant was daily replenished and enriched by loads of slaughter-house offal. The air from it at times was almost insupportable. Sleeping and other rooms were small and badly ventilated."

*Leyden.*—"Typhoid fever a rather prevalent disease. Our correspondent regards it as due to a specific poison in the atmosphere at certain seasons of the year, "coming we know whence," rather than to sanitary neglect. He has, however, frequently observed the disease to prevail where animal and vegetable matter was in a state of putrefaction, as near foul privies or over damp cellars holding decaying vegetables.

“In one family six persons had typhoid fever, and three died. In this instance the privy was found to communicate with the well.”

“The soil of the town, is, on the whole, rather dry than wet, surface uneven, and much exposed to north-west winds. Typhoid prevails more on the low than on the high ground.”

*Marshfield*.—“In the spring or early part of the summer of 1842, near the residence of Daniel Webster, a very malignant form of typhoid fever began to prevail about the middle of July. Some of those attacked died in forty-eight hours, without reaction. Many of those who lived a week had gangrenous spots, which sometimes became sloughing ulcers, an inch in depth. A few recovered under the influence of tonics and stimulants in very large amounts, but they made slow progress to health.

“In the latter part of August there prevailed a malignant form of erysipelas, with rapid and extensive sloughing of the skin.”

Our correspondent has no doubt that these diseases, appearing as they did to leeward, by prevailing wind, of the great accumulation of putrid fish, were due to this cause.

*Medway*.—We have had no general epidemic of typhoid since 1839. At that time the most severe and fatal cases were observed to be in houses with bad drainage and exposed to the influence of decaying animal and vegetable matter.

*Montague*.—“Typhoid fever occurs where the surface water has drained off or dried up, leaving vegetable matter which, at other times is covered, exposed to sun and air. My observation leads me to believe there is a close con-



nection between this disease, and foul soil and putrid air. It prevails more in the lowlands about swamps and stagnant water than in the upland."

*Middleton*.—Thirty years practice. Typhoid a rare disease. When it has appeared, it has been by single cases, without any apparent cause. If the greatest care was not given to ventilation it has spread by contagion.

*New Marlborough*.—"I have no doubt that foul soil from privies and pigsties is often connected with the development of typhoid fever, although I have not met with such cases. I have observed instances in which I thought the disease was due to rotting vegetables in cellars, and to old cisterns with stagnant water, and I make it a point when I have cases of typhoid to look out for these causes of impurity, and to remove them when they exist."

*Newburyport*.—During the war I have seen typhoid originate in camps from unventilated quarters and decomposing vegetable matter.

*Nantucket*.—Our correspondent recalls two cases of typhoid in one house, some years ago, which were apparently caused by a mass of turnips which had been left in the cellar and forgotten, until their presence was made known by the smell of decomposition.

*Newton Centre*.—Typhoid is rare here. In ten years I have not seen more than twelve cases, and two-thirds of these occurred among the theological students, on the top of a very high hill, where the subsoil is *tough marl*; the other four were at the base of the same hill, where the soil was swampy and the house-sills decayed. Improvement in two of these cases was very marked after removal to higher and drier land; two other cases were fatal.

*Orleans*.—"Typhoid fever was first known in this town and vicinity in the spring and summer of 1837. It was



then epidemic and severe, and pervaded the whole town. In my opinion the atmosphere of the whole place had become contaminated, tainted, *poisoned*, by the noxious exhalations from low, marshy grounds surrounding the numerous inlets from the sea."

*Oxford*.—Opinions based upon a practice of forty years. Our correspondent says: "I have very frequently observed a marked connection between typhoid fever and exhalations from privies, cesspools, pigsties, foul cellars, &c. These, together with filthy and unventilated places of living and sleeping, have appeared to me to be the cause of typhoid fever in a great majority of cases. So firm is my belief of this that when I meet with a case of this fever not readily traceable to some of these causes, I infer that the truth has not been told me, or that my perspective faculties have been at fault."

*Pittsfield*.—Has good reason to believe in the production of typhoid fever by local causes. In the summer of 1864 this disease appeared among the pupils of the Maplewood Institute. Among seventy-seven young ladies occupying the premises, fifty-one were attacked, and thirteen died. Three servants also died. A few rods from the school was a barn, whose yard was a basin holding foul water, in which swine wallowed, emitting an offensive odor. The kitchen drain discharged its contents on the surface of the ground. The vaults of the privies were shallow, filled to overflowing, and emitted an odor very offensive, and at times pervading the whole building. The grounds were excessively shaded by trees, and the sleeping-rooms were so shaded by piazzas and vines that the direct rays of the sun could not reach them. These were the causes of the fever. At the same time there was no unusual sickness in Pittsfield, and since the

removal of the causes above described, the Maplewood Institute has been exempt.

In December, 1835, typhoid fever appeared in Pittsfield, in a family of about forty persons, a boarding school for boys. The head of the school and four boys died. Eight or ten other cases recovered.

The surrounding community was healthy. In this family the water used was from a well under the wash-room. The drain from the wash-room was obstructed, and the foul water found its way under the floor and into the shallow well. The well was closed, and the family supplied with water from another source, and the fever subsided.

The published report of the Board of Health of the town of Pittsfield for the last year, shows the most intelligent interest in the prevention of disease, and the citizens of that town may be congratulated on having such faithful guardians of the public health, in the gentlemen who constitute the Board.

Our correspondent states that typhoid has been unusually unfrequent in Pittsfield during the past summer, and adds: "I am quite sure, and it is the general impression here, that our comparative freedom from fevers during the past summer, has been largely due to the activity of the Town Board of Health in causing the immediate removal of every removable nuisance or source of sickness. Our Board of Health has now acquired so established a character that our 'notices' have been immediately complied with. In only two cases has it been necessary to remove a nuisance and collect charges of the owner."

*Provincetown.*—In a practice here of more than thirty years, typhoid has been a rare disease, never epidemic.

I have had sporadic cases which were aggravated by ill-ventilated rooms. For fifteen years past typhoid fever has been almost unknown among us. Now and then a sporadic case occurs; whether this is owing to our keeping the town clean, or to the inhabitants taking better care of themselves, the fact is that typhoid is so rare with us that we do not look for it unless it is imported, while Truro, Wellfleet, Eastham, Orleans, Chatham are not so exempt. We shall keep free from filth for general convenience, comfort and sightliness, and if by so doing we keep off disease, we are by so much the gainers."

*Pembroke.*—"Some of the most severe and fatal epidemics of typhoid dysentery I have seen, occurred in very dry seasons, in the vicinity of large ponds or low, marshy places, usually overflowed, but then exposed by prolonged drought."

*Rockport.*—"I have noted cases of typhoid which seemed to be connected, in one instance, with vegetable, and in another, with animal decomposition. In December, 1868, I was called to see two cases of typhoid in a room underneath which was stored a large quantity of turnips and cabbages which were rotting, and the odor from which was extremely unpleasant. Soon after two other cases occurred in another family, in the room immediately over the first, while in the opposite end of the house, also occupied by two families, but not directly over the vegetables, no case occurred."

*Reading.*—"Three years ago there prevailed here an epidemic of typhoid dysentery, beginning in the middle of August, and lasting about six weeks. There were eighteen deaths. One a young girl, was living in a high, dry, healthy spot, a half mile from the rest. All the others were in or near a circumscribed locality, low, level,

wet ; the ditches full and overflowing, the wells also, and some of the latter I know were offensive.”

*Rochester*.—“Forty years ago typhoid prevailed extensively in this town. I was then in practice, but I cannot from memory throw any light on the causes. A few years since I knew a whole family sick of typhus from a very foul cellar. One died.”

*Somerville*.—The most severe epidemic known here in fifteen years, occurred in July and August, in a section of the town sloping to the south with decidedly dry soil and with good well-water. “I regard bad air as one of the principal causes of this disease. The most unhealthy condition we ever experience is to live in a house with a wet and imperfectly drained basement. Large and well ventilated sleeping rooms are indispensable to health, and equally so for the recovery of the sick.”

*Shrewsbury*.—“I have observed for some years an apparent connection between foul soil—and consequently air—and typhoid fever. I have often believed a vile sink-drain, or rather sink-pool, to be the cause ; also, butchers’ slaughter yards, the foul effluvia from which have seemed to favor typhoid and dysentery of a low grade.”

*Spencer*.—“Have observed instances where typhoid fever seemed to be directly caused by foul air from pigsties and privies. Five cases at an isolated farm-house in 1867, apparently due to the foul air from a pigsty. The disease more prevalent in houses supplied with water from wells.”

*Stockbridge*.—“A few years since there were several tanneries on the river just above us, from which tons of filth were cast into the stream to be borne away or scattered over the low land as chance or flood might direct. The result was a dreadful stench and a prevalence of

typhoid fever, causing numerous deaths. The tanneries were finally removed, and water introduced from a neighboring hill through iron pipes ; and, with a purer air and delightful water, typhoid fever has almost become unknown. Nearly all the people used wells formerly, while we now have a fine reservoir."

*Southampton*.—"Have observed typhoid fever to prevail with great severity in a neighborhood where a mill-pond had been drawn off, leaving the debris at its bottom exposed to a hot sun, generating putrid air."

*Stoneham*.—"I think there is a connection, and an intimate one too, between typhoid fever and foul soil. Several cases could be distinctly traced to this source, in the form of filthy privies and pigsties."

*Springfield*.—"In three-fourths of the cases of typhoid fever coming under my observation in this city, during the past eight years, *foul soil* from privies or defective drains was present, and in, I should say, one-third of the cases impure privies were on the premises.

"Most of my cases of typhoid have been found in ill-ventilated apartments and overcrowded tenement houses. In a large number I could trace the cause directly to impure air from decomposing animal matter. In several families where it prevailed the cellar was inundated with sink-drain water."

*Sunderland*.—Our correspondent in reply to the third question of the typhoid circular, says: "In several instances, the connection has been of such a nature as not to admit of a reasonable doubt. In one case a whole family was down from the influence of a neglected cistern."

*Swampscott*.—Three cases of typhoid are reported as occurring at about the same time, and among the crew of the same schooner. They had been exposed on board to

the emanations from a quantity of putrid clams which were very offensive.

*Taunton.*—"The disease has been observed to be prolonged and convalescence made tedious when sinks and cesspools and cellars were neglected.

"It is not unusual to meet with cases of typhoid in boarding houses of unskilled laborers. In such cases I have sometimes found them in an attic room with three beds, two men for each bed, one window in the room and the upper sash fixed."

*Tewksbury.*—Our correspondent states that some years ago, while he was in charge of the Monson State Almshouse, typhoid broke out in a detached building occupied by idiotic and epileptic patients, and was arrested by clearing it out, and having it thoroughly cleansed.

*Upton.*—I have observed a connection between typhoid symptoms in fever and other diseases, and foul air and soil from want of proper drainage, unventilated sleeping-rooms, and decomposing substances in and about the houses, and where these conditions of impurity were most obvious, typhoid was most severe.

*Uxbridge.*—Several cases in one house apparently proceeding from filth spread upon the ground from a sink-drain. No new cases after removal of cause.

*Webster.*—Our correspondent believes that putrid air about houses is a prolific cause of typhoid. "During an epidemic of typhoid fever in 1864, I met with about forty cases in three tenement houses." I attributed this to the exhalations from the cellars and sink-drains having free access to the rooms.

*Ware.*—A young man had typhoid after cleaning a dirty cellar. While engaged in the work he complained of its making him feel sick, and two weeks after came



down with severe typhoid fever. Instances of apparent contagion from one case to another have been observed.

*Westfield.*—"Have had a great many cases which could be directly traced to decaying vegetable matter coupled with moisture, in cellars and about houses."

*Warren.*—"In two instances have thought there was a connection between the disease as it appeared and ill-ventilated cellars."

*Wrentham.*—Twelve cases under observation of our correspondent last September. "In each place where it occurred, the water used by the family was of questionable purity; privies or sink-drains being very near the well. In one instance a direct communication between an obstructed sink-drain, and the well was shown to exist. Little attention is paid to the condition of cellars. Drains and privies are often too near wells. Hence typhoid and dysentery."

*Westborough.*—Our correspondent believes that he has often seen a connection between typhoid fever and foul-soil and air, but limits the connection to cases in which the decomposing matter was under cover, as from cellars, or from drains which had become obstructed and thus thrown their contents back to the cellar or under the dwelling. He is also suspicious of the influence of shade-trees in close proximity to the house.

*West Newbury.*—"We have had no epidemics of typhoid or typhus for the past ten years—a few cases arising from local causes. We have had, however, two epidemics of dysentery, ascribable to local exciting causes in connection with continued hot, dry weather. These causes were bad sink-drainage, filthy cesspools and slaughter houses not properly disinfected, the waste being matter thrown into pig-pens to be partially eaten by pigs, and



the rest to become decomposed, and render the air impure and noxious for quite a distance from them."

*Wales.*—"In years past have observed the connection between typhoid fever and foul-soil, and putrid air from dirty cellars and unventilated sleeping-rooms."

*Watertown.*—Five members of a family were successively attacked with typhoid fever in the autumn of 1868. A foul smell had been perceived soon after the first case occurred, and the drain was taken up and examined, *but nothing wrong was discovered*. Some weeks later, a *more careful search* being made, it was found that an opening existed between the drain and an air box which conveyed air from without to a chamber behind the kitchen range, and thence to the bath-room and other parts of the house. A *third search* being made still later in the season, another opening was discovered beneath the wash-room floor. The workman who took up the floor was so overpowered by the effluvia that he had to be assisted to the outer air.

*Winchester.*—I had last fall two fatal cases of typhoid in the same house, where the water came from a cistern exposed to contamination from a leaky sink-drain. At the same time the vault was overflowing, though not in a position to make it probable that its wash affected the cistern. They died of distinct blood-poisoning.

*Waltham.*—"A brook in this town flows about six months of the year; at other times there is only a ditch of stagnant water. It is just back of an Irish settlement. Typhoid usually commences here, and is more prevalent and more severe than in any other part of the town."

*Worcester.*—Our correspondent says: "When I first came to Worcester there was a row of privies in Maple street, which drained into the wells near by, and typhoid fever raged until the use of the water was discontinued.

I have found more of the disease on hills where, under the soil was a ledge. My opinion always has been, that in such places, the water became retained in cavities in the rocks under the soil, and was the cause of the disease."

The following is condensed from a report of the consulting Physicians of the city of Boston 1870.

The death-rate of Boston has been for some years past so high to excite the attention of the medical profession.

With natural advantages for drainage and ventilation equalled by very few cities in the world, and with an abundant supply of pure water, there is still an average annual mortality of between twenty-four and twenty-five to the thousand of population.

During the past ten years the chance of living has been not quite as good in our City of Boston, almost surrounded by the sea, with a population of 200,000, as in London, on the Thames, with a population of 3,000,000.

The greater vital depression caused by want and misery in that most vast of modern cities seems to have been more than counteracted by the careful protection of public health.

Comparing the mortality of Boston with that of other parts of the state, the indications are also very unfavorable.

Half of the people of Massachusetts live in districts where the annual mortality does not exceed seventeen or eighteen to the thousand.

In 1868, the last year of which the records are published, four hundred and eighty-seven deaths from cholera infantum occurred in Suffolk County, while in an equal population outside of the city limits the number was less than one hundred. The mortality from all bowel diseases of children is in similar proportion in Boston and in the country.

There are causes for this excessive mortality, and it is our duty to try to discover what they are, and if possible to point the way for their removal.

Among the first requirements for public health in a crowded city are sewerage and pavement,—such sewers as will cause all the foul liquids to flow away by force of gravity, and such pavement as will prevent all soakage into the soil.

To obtain these in perfection is a work of time, of great cost, and of the highest engineering skill.

But there are other means of protecting public health easily reached, and whose benefits might be at once enjoyed by the citizens, to which we would invite your attention, as we deem them to be of great importance.

Our streets are not clean. It is perhaps unfortunate for sanitary progress in Boston that comparison in this respect with New York is so readily made.

We return from that city congratulating ourselves on the superior cleanliness of Boston streets, which no one can question, but sometimes forgetting that the standard of comparison is a very low one.

Board of Health of the City of New York have already accomplished a sanitary work from which other great cities may learn many useful lessons.

They have reformed the tenement houses, suppressed dangerous epidemics, cleaned and disinfected the vaults, and removed or regulated all offensive trades; but the streets have been always entirely beyond their control, and the Board of Health are not in the least degree responsible for their condition. Streets cleaning in New York is a corporation job.

There can be no doubt that, in so far as the streets are concerned, New York is the most filthy great city

in the civilized world. Our standard of comparison should be the streets of the great cities of Europe, which are as much cleaner than the streets of Boston, as ours are cleaner than those of New York.

The dirt of the streets of Boston is made up in great part, of the excrement of horses. This is allowed to accumulate, being alternately dried by the sun and air and soaked by the rains and watering carts, until it forms a foul and dangerous compost, tending directly through the air with which it is in contact, to the production of disease. The interests of public health require that it be removed with much greater frequency than is now practised. We are of opinion that, during the summer and early autumn, every street in the city should be cleaned once in twenty-four hours, and the great thoroughfares by night.

There are, in all parts of Boston, filthy back-yards, alleys, and passage-ways, broken-down and overflowing vaults, and in the older portions, disused wells and cisterns, which are receptacles for dirt. All these nuisances should be reformed.

Offensive trades like fat-melting and bone boiling, are carried on in open vats in the midst of a crowded population. They should be compelled to use methods, tried and approved in New York, by which the sickening vapors may be entirely consumed.

The authority to control these trades is given by States. House-offal, or swill, is allowed to become putrid before removal from the houses of the citizens. The offal is a source of profit, being kept by special ordinance free from mixture with ashes, which would tend to prevent its becoming offensive; but this enforced division of refuse material makes it the more obligatory upon the

city authorities to take the dangerous portion away before it undergoes decomposition.

In our opinion public health requires that house-offal should be removed, in summer and early autumn, every day from every house.

Our tenement houses are in a condition discreditable to a civilized community. It is only necessary to visit Friend Street Court, or the "Crystal Palace" in Lincoln Street, for any citizen to see under what desperate circumstances the occupants of these and hundreds of other similar houses are compelled to live. Their rents are enormous and their condition calls for the relief which the Legislature of 1868 intended to afford them through the Tenement House Law.

This law has been a dead letter, but the interests of public health, require that it be enforced without delay.

It is now no one's duty to inspect the fresh provisions offered for sale in Boston, while the law provides for the destruction of all which are unsound, and of all meat of any calf killed when less than four weeks old. We believe the public health requires the enforcement of these laws, and we would respectfully suggest that a systematic inspection of meats, fish, vegetables and fruits be made by city authority, in a manner similar to the inspection of milk, which has proved to be so useful.

We think that all the reforms to which we have referred are practicable. They concern every citizen, whether he may chance to live in a good home, with apparently wholesome surroundings, or in the most wretched tenement house, for no one can escape the general influence of the sanitary condition of the city in which he dwells.

These reforms would require an outlay of money, but we believe they would prove to be good investments, and that a true economy demands them.

The money value of human life to a community is real. A destructive epidemic is expensive. Moreover, a clean and unquestionably healthy city, such as Boston might be made, would have attractions for permanent residents and transient visitors, which could not fail to favorably affect its commercial interests.

It might also well be an object of pride with every citizen to furnish in Boston an example of public cleanliness and public health which other American cities would imitate. The foregoing remarks and observations applies with equal force to Baltimore as to Boston.

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CONDENSED FROM THE MASSACHUSETTS BOARD  
OF HEALTH REPORT, 1870.

The streets in Boston are still very dirty, the alleys and passage-ways and back-yards often filthy, the vaults still broken and overflowing, the air of crowded neighborhoods made sickening by bone-boiling and fat-melting.

House offal is still a nuisance in all parts of the city, by being kept until putrid during the warm season.

Unsound provisions, both meat and vegetables, are freely sold, and as it is nobody's business to enforce the law on this subject, it is a dead letter.

The tenement houses of Boston, the houses in which the most impoverished and unhappy portion of our fellow-citizens are crowded together, are a disgrace to our civilization. Through their squalor and wretchedness they foster crime as well as disease.

Moral and physical health must equally suffer under their shadow.

All such premises are at the present time crowded to overflowing. Often twenty families may be found using



the same privy, filthy and repulsive in condition. Nowhere in these houses can the slightest evidence be seen to-day of the existence of a law of the State passed in 1868 for their regulation, and whose execution is vested exclusively in the Board of Health of the city of Boston.

Men of research and of great ability have probed the history of the epidemics of the middle ages, and have made it appear more than probable that their virulence, if not their origin, was due to the filthy habits of the people.

The medico-scientific world is now profoundly impressed with the idea—we may almost say the belief—that zymotic diseases, including all the so-called epidemics, are propagated by distinct particles, conveyed by air or by water.

We need not call them “germs” or even seeds. It is sufficient to call them “contagion particles.”

The death-rates of East Boston and the North End present a contrast which is worthy of examination. These Districts are of nearly equal population, and the numbers at all ages very nearly correspond, yet the mortality in one is half as great again as in the other. One is crowded, in great part deprived of sunlight, and full of nuisances; the other has abundance of light and air. Can a stronger argument be offered in favor of providing breathing spaces for the people than is presented by this state of things.



CONDENSED EXTRACTS FROM THE LAST REPORT  
OF THE NEW YORK BOARD OF HEALTH.

“Gotham Court” is a gigantic specimen of the “packing-box tenement house.”

The “barrack” buildings on the “court” furnish sufficient room for only 584 individuals.

They have, at times, been packed with nearly double that number. The following *un-sanitary* conditions exist in these buildings: (1.) The *roof* is a general (and by no means safe) play-ground for children, and a *place of deposit for ashes, garbage*, and to a large extent *is used as a privy* by the tenants, whom I cannot blame for preferring it to the foul, dark, and dangerous underground privies. (2.) The plaster and wood-work of the hallways is out of repair and filthy; and the rickety *stairs leading down into the cellars* are entirely unprovided with hand-rails, and the steps being narrow, thick with mud and filth of every kind, and unlighted, *are*, in fact, *dangerous*; the general condition of the lower halls being also extremely filthy. (3.) The *cellars* are *dark, horribly foul, and filled with mud, rubbish, and human excrement*. (4.) The *privies*—which open into and are reached through these cellars—are horrible breeding tanks of disease.

An open ditch or drain extends the whole length of the court (234 feet), filled with rubbish, excrement, and indescribable filth. The horrible odors from this immense subterranean cloaca have no vent except through the small iron gratings in the pavement of the yard of the court overhead, and through the cellars and up the stairways, and thus through the entire house. It must be

remembered, also, that after it reaches the open air of the yard, *the odor rises up between the two piles of buildings* (each five stories high), which are separated only by a distance of nine feet wide.

The poison thus concentrated is very directly applied to each and every apartment in the buildings, and there is no escape from it, because, from the peculiar back-to-back construction of the tenements, not a single room has any through and through ventilation. Added to the actual filth of the privies, is that arising from the court yard itself, into which much rubbish and garbage is thrown by the tenants, who will not go into the filthy cellars, and throw much of their refuse—of all kinds—down through the gratings which furnish light to the privies and which are often fringed with disgusting filth.

For the same reason, as we have seen, the roofs are used for ashes, garbage, &c.

Gotham Court is a nuisance which, from its very magnitude, is assumed to be unremovable and irremediable. I venture to suggest that it is neither.

The power committed to the Health Department of New York, for the protection of life and health, are vast and absolute, and here is a nuisance, or a combination of nuisances, “dangerous to the life and detrimental to the health” of such a body of people, as to warrant a prompt and radical exercise of those powers; this is demanded by every consideration of right, and cannot fail to be productive of vast benefit.

## NINTH DISTRICT.

A. B. JUDSON, M. D.

Special sanitary Engineering embraces the internal arrangements of architectural erections with reference to light, heat and ventilation ; also the personal habits conduct of life, and the proper disposition of refuse matter, etc.

As soon as a portion of water is beneath the surface it is acted upon by capillary attraction in addition to the force of gravity, the tendency of which is to hold it in suspension, whereby the soil becomes soured and chilled by the evaporation which carries the water off in the shape of mist, so that even in those sections of the country where there is no evidence of marshes or swamps, the nature of the soil may be such as to render it extremely unhealthy.

There are plague spots and fever nests which exist in the vicinity of old obstructed drainage streams, which no sanitary regulations can eradicate, and which require the most careful and unceasing vigilance to prevent the spread of epidemics, which an unfavorable condition of the atmosphere is always certain to create.

An entire family, including the servants, residing in a very expensively built house on Fifth Avenue, died of diphtheria. The house was located over an old water course.

A well known citizen, of large wealth, says his only daughter had died of a disease contracted from malaria in his house, which he discovered was over a neglected water course.

Many persons have found that their families were always sickly until, having ascertained that their houses were damp from this same cause, they removed from the locality.

Facts of this nature are almost daily brought to notice.

Nothing in the administration of civil affairs is of more importance to the welfare of a city or the health and comfort of its population, and which carries with it a greater measure of responsibility than that of providing a proper system of removing surplus water and refuse matter from the limits of the city.

With all the experience of the past to guide us, we find that the unsystematic manner in which the sewerage of our large cities has been conducted, has already resulted in serious evils.

“There are already more than two hundred miles of sewers under our streets.

“To correct or even lessen the evils resulting from so many years of mismanagement is a task requiring much study, care, and time.”

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FROM THE REPORT OF SANITARY ENGINEER,  
EGBERT L. VIELE.

STREET PAVEMENTS.—There is perhaps no one subject connected with the growth and improvement of cities which has had so marked an effect upon the health of the inhabitants as that of paving the streets.

Louisville, Kentucky, is mentioned by the same writer as furnishing one of the most remarkable examples of the beneficial change produced in the health of a city by paving.

No city can be healthy unless the streets are paved, and they should be well paved in the beginning.

An inferior pavement is almost worse than none at all, as it is constantly out of repair, and fails in its purpose as a sanitary measure ; and when we take into consideration all the inconvenience and evils attendant upon a bad pavement—the frequent repairs required, the additional wear of carriages, the greater amount of traction, and consequent loss of power, and the injury to horses—it will be found that a cheap pavement is always the most expensive in the end. Besides, the cleanliness of a city—its scavengering—depends so much upon its pavements ; for whatever may be the character of the soil, it is impossible to keep the streets cleaned unless they are well paved.

The refuse matter which collects upon the surface, and which it is impossible to remove except from a pavement, becomes incorporated with the soil, and supplies a constant and fruitful source of disease ; and in a bad pavement, the holes that are constantly being formed are the receptacles for offensive materials.

It would be safe to assert that in this great city, with its million inhabitants, there are not one hundred buildings, either public or private, that can be said to be well ventilated, and, therefore, nearly every inhabitant is at this moment inhaling impure air. The pallid face, the hectic cough, the lassitude of body and loss of energy, are all the accompaniments of impure air ; and vice and crime, so often associated with poverty and want, seem also inseparable from vitiated atmosphere.

The question as to the proper disposition of refuse matter, involves some of the most important considerations with which sanitary authorities have to deal.

One of the things to be done is to impress on the popular mind the great necessity of some unity of action in the solution of this problem.

The points involved are :

*First.*—The thorough removal from the city of every kind of decomposing matter, either animal or vegetable.

*Second.*—To conduct such removal so as not to endanger the public health.

*Third.*—The utilization of refuse matter so that its economic value shall not be sacrificed.

*Fourth.*—To conduct this utilization with a due regard to public health.









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